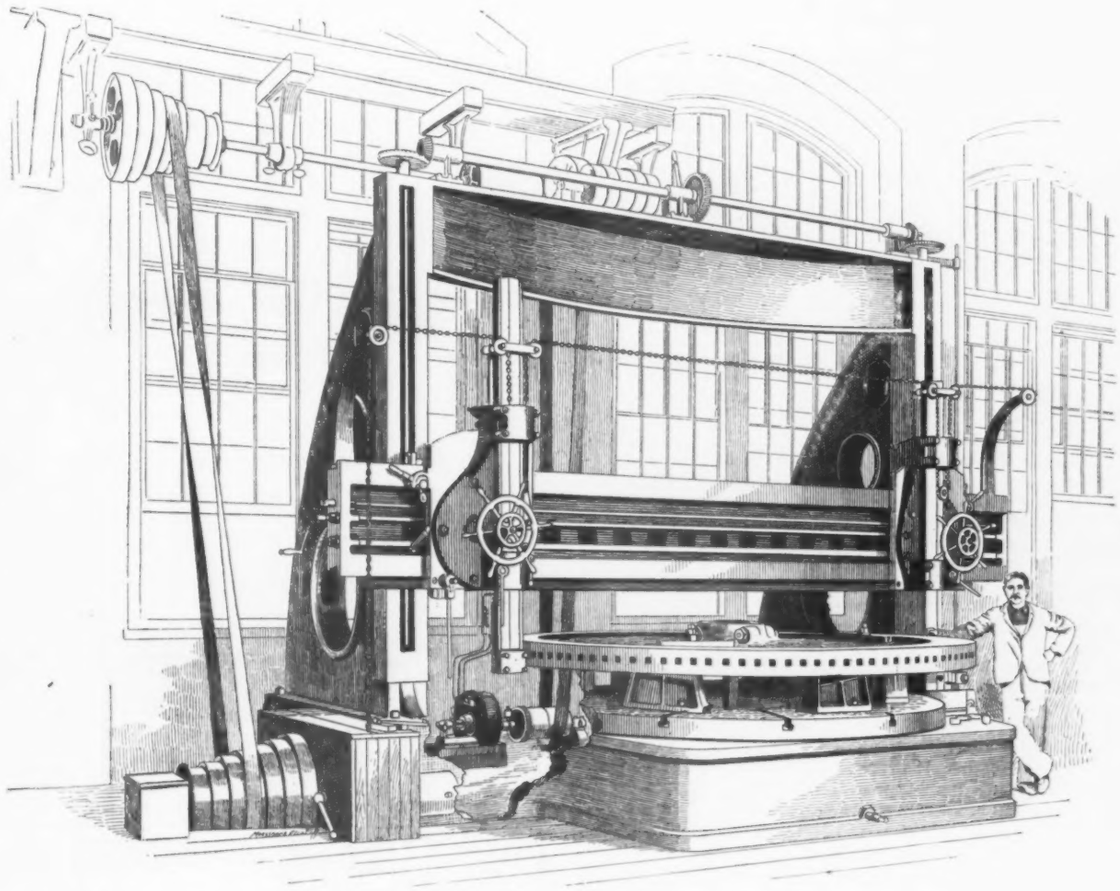
THE IRON AGE

THURSDAY, OCTOBER 20, 1892.

Electric Motors in a Machine Shop.

Some time since the De La Vergne Refrigerating Machine Company, at foot of East 138th street, New York City, were compelled by their rapid increase in business to extend their already large plant by the addition of an erecting shop. While this building was made to conform in all details with the best factory practice of the day, a decided innovation was introduced in the method of driving the machinery placed in the building. E. V. Clemens, the superintendent of the works, after thoroughly posting himself upon what had already been done in the employment of electric motors, and fully considering the questions of cost of installation and cost of operating, decided that all work in the shop should be performed by the electric motor. While we have noted in former issues the employment of electric motors in isolated cases, and sometimes, as in the C. & C. shops of this city, where electric motors are used exclusively, but where the work performed is of a comparatively light character, we believe that this is the first case on record where a machine shop equipped with tools requiring large units of power is run exclusively with electric motors. Mr. Clemens, therefore, in taking this step had no precedent or guide to look to for instruction and was compelled to take the electric motor as he found it; but having confidence in the work it had already performed in other cases and under trying circumstances, he decided that it would be wise, all things considered, to put it in this shop. Although the plant has now been running for several weeks, it is still too early to give an accurate estimate of the exact economy; but at the same time the work already done has shown conclusively that the electric motor as compared with the ordinary method of transmission of power by shaft and belt will give a direct saving in the amount of power required to do the work of at least 7 per cent., and in addition to this the cost of maintenance is considerably less, although, as stated, the exact percentage cannot yet be calculated.



Boring Mill Driven by Electric Motor.

ELECTRIC MOTORS IN A MACHINE SHOP.

Before describing the equipment we shall take up first the building itself.

The Erecting Shop Building.

The building proper, as shown by the plan view Fig. 5, extends in a direction parallel with the other main buildings and forms an extension running west of the boiler house. It measures, over all, 350 feet by 54 feet 8 inches, the distance between the side piers being 15 feet 10 inches. A railroad track extends down the center of the building, and there are also two transverse tracks leading to the yard and to the machine shop proper. As shown in Fig. 8, which is a cross section, the building is two stories in hight, the upper floor being devoted to light machinery, and being lighted from the sides and roof.

A noticeable feature in the lower story, the clear hight of which is 32 feet, is the ample lighting. In this respect we do not know of a shop more thoroughly lighted in every part, and, more than this, lighted completely at all hours of the day. As will be noticed from the side elevation, Fig. 6, the entire space between the piers for about the lower half of the distance between the first and second floors is occupied by windows. In addition to this, above the tracks for the traveling crane are smaller windows, the latter giving a light such as would have been received from a monitor roof.

Heating.

The building is heated by means of steam taken taken through a pipe laid in a tunnel extending down the center of the building and having side branches leading to radiator coils placed along the walls. Covering the tunnel containing the steam pipe are wooden slats placed a short distance apart in order that heat from the tunnel may be admitted into the room. Provision has also been made for thoroughly ventilating the room. The floor is the usual factory construction, being two courses upon which is laid a hard maple top course separated from the other by asbestos sheets.

Fire Protection.

Mr. Clemens has certainly carried his ideas of fire protection to what we might call the "best" extreme. In other words, he has introduced every known appliance for the quick extinguishment of a fire, working under the idea that no building can be made fire proof until the entire contents of that building shall also be fire proof. He has, therefore, taken no risk whatever. In the boiler house adjoining the end wall of the erecting shop is sunk a pit in which is placed a tank and also a fire pump. From here lead pipes extending to the most available points through the building, where coiled lines of hose are placed, these locations being so selected as to provide for the easy reaching of the hose, no matter at what point the fire may break out. Further than this, the top floor is furnished with automatic fire extinguishers, and at each pier is a wooden bracket on which is a fire pail. There are also chemical fire extinguishers and hand grenades. It will be seen from this that adequate means are provided for fighting fire; but without proper discipline and especially a thorough and frequent inspection of the plant, it might be of little service in case of emergency. To guard against this, every few days all the lines of pipe are carefully inspected and tested to see that they are in proper working condition, and a trial in which the men are apportioned to certain duties is carried forward in order that should a fire break out at any point the apparatus nearest thereto may be efficiently and quickly handled.

Appliances.

As we stated previously, work is brought into the building from the machine shop on the tracks shown in the plan view. It is distributed in the erecting shop by means of a 3 motor Morgan electric crane having a capacity of 15 tons, a span of 52 feet, a clear hight of 24 feet 10 inches, and a travel of the bridge of 380 feet a minute. This crane covers the entire shop and is employed in the handling of all heavy pieces. At the western end of the shop is a hydraulic elevator having a lifting capacity of 3 tons, and which is employed in raising and lowering work between the two floors.

An admirable and simple provision has been designed by Mr. Clemens for the mounting of the arc lights which are distributed through the shop upon either side, and which are used for what we may call the general illumination of the shop during the night time. Pivoted on the wall is a bracket extending out 8 or 10 feet into the shop and which is so mounted upon a cam bearing that when swung to one side—for instance, to move it out of the way of a load carried by the crane—it will swing back in a position at right angles to the wall when released. A set nut serves to hold it in any other desired position. Although extremely simple and of small cost, this has proved to be a great convenience, since it permits of the moving of a light to one side, whenever necessary, without undue trouble.

The Equipment.

A glance at the plan view upon which are marked the several machines composing the equipment of the shop will show that the work performed is of an unusually heavy character. We find upon one side, beginning at the eastern end, a 15-foot boring mill, next a 10 foot planer, horizontal drill and portable drilling machines. Opposite these are two 18-inch slotters, a 54-inch steam cylinder boring machine, 72-inch lathe, and also another set of portable drills. The actua work of

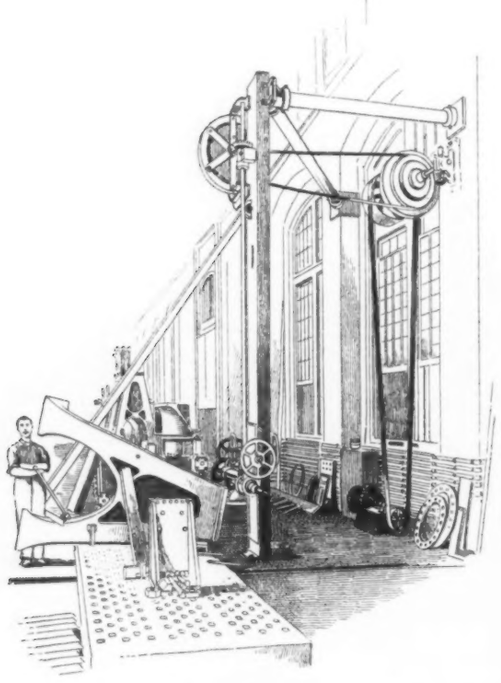


Fig. 2.—Horizontal Drill Driven by an Electric Motor.

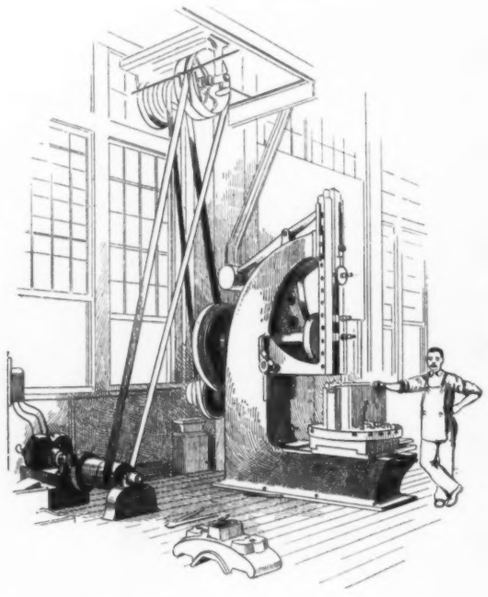


Fig. 4.—Slotting Machine Driven by an Electric Motor.

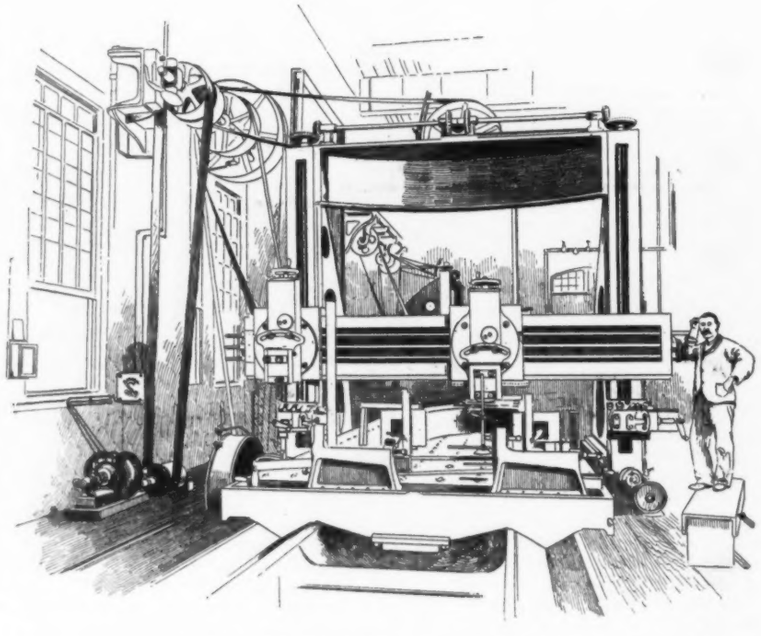


Fig. 3.—Planer Driven by an Electric Motor.

ELECTRIC MOTORS IN A MACHINE SHOP.

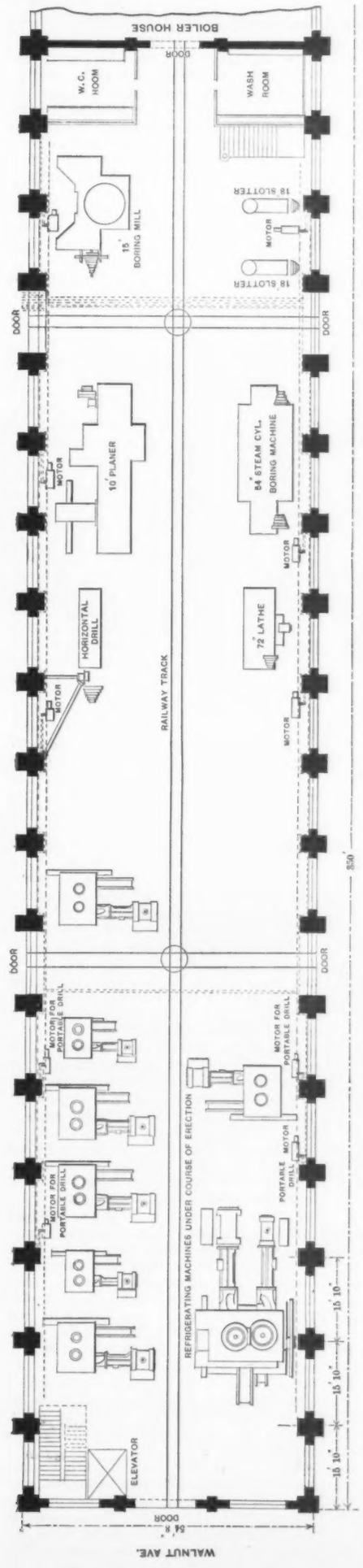


Fig. 5.—Plan of De La Vergne Erecting Shop.—Dotted Lines Indicate the Wiring.

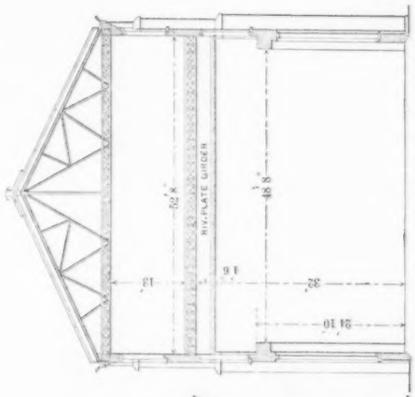


Fig. 8.—Cross Section.

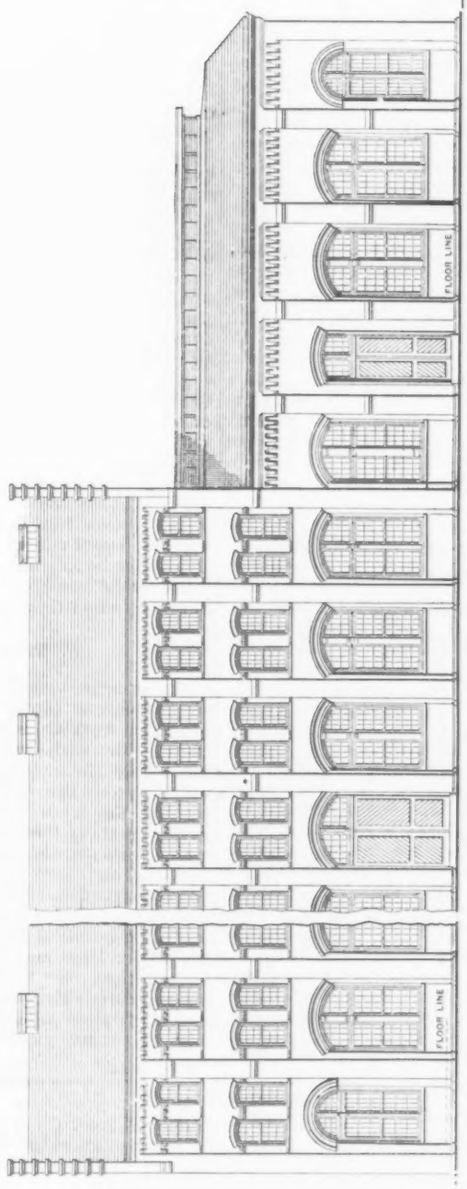


Fig. 6.—Side Elevation.

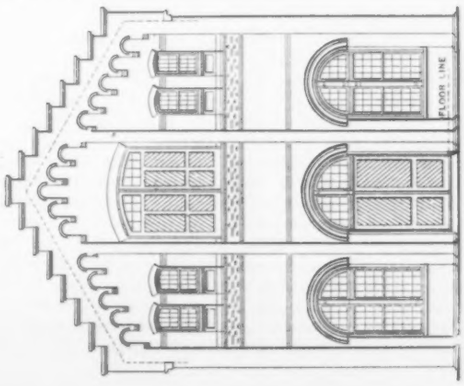


Fig. 7.—End Elevation.

ELECTRIC MOTORS IN A MACHINE SHOP.

erection, as indicated on the plan, is performed in the western end of the shop, the work passing through the shop without any retracing of its steps until it reaches the erecting floor proper.

Machines Driven by Electric Motors.

We now come to what is perhaps the most important and what is certainly the most novel feature in the entire shop. This is the fact that all power without exception is derived from electric motors. The dynamos supplying these currents are of the Thomson Houston type and consist of two 40 horse-power giving a current of 220 volts. These are driven by vertical engines of the Hewes & Phillips type. It is expected to use both of these motors when the shop is fully equipped and running to its full capacity, but at the present time the motors are used alternately, one being held in reserve. The belt from the engine passes to an overhead shaft, from which a belt passes to a shaft on the floor (this machinery being located in the engine room in the shop adjoining the erecting shop), upon each end of which is mounted a friction pulley, each one of which drives one of the dynamos. From this method of mounting either or both dynamos can be run as may be required, and any change from one to the other can be almost instantaneously made. The engine is of 100 horse-power.

Wiring.

On the wall back of the dynamos is a switchboard from which the circuits leading to the erecting shop are controlled. Two of these circuits lead to the top floor, and will be used in driving motors operating the light machinery there to be placed. One circuit leads to the planer, which is 10 x 10 x 30 feet; another leads to the 15-foot boring mill, another to the portable drills, one to the 18 inch slotters, both of which, as will be noticed, are run by means of one motor, while other circuits will, when the machines have been installed, lead to the motors driving the 72-inch lathe and 54-inch steam cylinder boring machine. The wire of these circuits is copper, No. 3, Brown & Sharpe gauge.

The Motors.

The motors are all of the C. and C. type and are of 10 horse-power except the one on the drill shown in Fig. 2, which is of 5 horse power; the motors operating the portable drills are 2½ horse-power. At each motor is a resistance coil placed in the circuit and introduced in order that when the current is first turned on the motor may pick up the load gradually, increasing its power as the load is increased. On the armature shaft is mounted a fiber pinion engaging with a gear on a shaft carrying a pulley, the belt from which leads to an overhead counter. From here the belt driving the machine is extended. The engravings from Fig. 1 to 4 inclusive give a very clear idea of the method of transmitting the power from the motor to the machine. The fiber pinions used have given the utmost satisfaction, inasmuch as they run almost noiselessly and so far have shown very little signs of wear. The motors run at a speed of about 1100 revolutions per minute.

The Power Required.

It has been estimated from some tests which have been made that the average power required by the boring mill is 6½ horse-power and of the planer 8 horse-power. In regard to the latter machine, one thing was quickly noticed. We may state that the planer returns about three times as fast as the cutting stroke. It was found that at each reverse the power required ran from 15 to 18 horse power, and that the momentum of the armature alone was not sufficient to carry it over without noticeably reducing the speed of the motor. Provision has been made for overcoming this by placing on the motor shaft a fly wheel intended merely to aid in the reversing of the planer. It is expected that when this has been introduced the reverse will take place without appreciably reducing the speed of the armature.

General Advantages.

In introducing this part of the subject we may state first that so far the entire method of driving has given the utmost satisfaction to all concerned. No trouble whatever has been experienced with the motors. In every case they have stopped promptly, started promptly and developed all the power needed. It has proved to be decidedly superior to shafting in that it requires almost no attention whatever, occupies room which would not be otherwise utilized, and its cost of maintenance has so far been insignificant. No provision is made for stopping them by means of shipper belts. The machines can only be stopped by turning off the current and stopping the motor. This has given no inconvenience, since the lever controlling the current is placed within convenient reach of the operator, and if necessary it would be a simple matter to prepare appliances from this lever to any part of the machine, so that it could be controlled from any standpoint. It is in this point where the principal economy comes in. When the machine is idle there is no expenditure for power, the economy being traced straight back from the dynamo to the boiler. This, as stated in the first part of the article, has been estimated at 7 per cent. It will certainly not run under this and may go beyond. It has further been found that in actual work in heavy cutting on the planer and also on the boring mill that the machine picks up the load apparently as easily and as rapidly as with the ordinary belting.

Tests.

The principal reason why complete and accurate figures cannot be given now of the actual working of the system is because of the variation in the work performed by the machines. An adequate series of tests can only be made by extending the trials over several months, noting carefully the work performed at different times and the power required to perform it, and then getting the average power expended. This will, of course, occupy time, and yet provision has been made for carefully carrying it out and at the proper time making it known. We cannot close our brief outline without congratulating Mr. Clemens upon the success of his plant so far, and expressing the wish that it may meet his utmost expectations.

The Kansas City *Star* says that the official records of the State Board of Agriculture of Kansas give surprising proofs of the capability of the soil of that State in the matter of agricultural production. Great as has been the increase in population, the percentage of increase in cereal products has been still greater. In the ten years from 1869 to 1879 the increase of production was: Corn, 609 per cent.; wheat, 1549; oats, 3232 For the ten years from 1879 to 1889 the increases were: Corn 158, wheat 111, oats 231 per cent. The ratio of increase in all cereals in the 20 years from 1869 to 1889 was 2142 per cent. In 1860 the State population was 107,206; in 1870, 364,399, an increase of 239 per cent.; in 1880 the population had risen to 996,096, a gain of 173 per cent,; in 1890 the population was 1,427,096, an increase of 43 per cent.

The Reagan Injector.

The objects sought by the designer of the Reagan injector were to enable the capacity of the injector to be varied at will, and to adapt it to force hot water into the boiler. The first object is accomplished by making the steam nozzle adjustable so as to control the water supply, and also by providing a number of combining tubes of different sizes, arranged so that any one of them can be brought into operative position. The second object is attained by cooling the steam just before it discharges into the water space.

The interior of the body A is divided by partitions into four chambers, 1, 2, 3, 4. The steam pipe B enters the chamber 1, and the water pipe C enters the chamber 3. The steam valve D is conical and is tightly held by the steam pressure against a conical seat formed in the partition between the chambers 1 and 2. The valve and seat are provided with parts which can be made to register or not by turning the valve spindle d, which is provided with a handle, as shown in Figs. 1 and 3. The end of the chamber 1, opposite the valve, is closed by a screw plug, E, which affords ready access to the valve and its seat.

In the partition a^2 is an opening surrounded by a cylindrical neck, a, as shown in Fig. 2. In this neck slides the steam nozzle F, formed with a packing ring, f, sprung into a groove. The nozzle is operated by a screw stem, G, which meshes into a threaded boss in the end of the chamber 2, and has a hand wheel, g, outside the injector. The inner end of the stem has a head, g', which engages a yoke, F', connected with the nozzle by arms. The combining tube H is secured in the partition a^4, between the chambers 3 and 4. It is funnel shaped and the nozzle extends into its flaring mouth. By shifting the nozzle the annular space between it and the combining tube is varied, thus varying the quantity of water passing into the tube.

There are several delivery tubes of different sizes. They are grouped in a cylindrical revoluble barrel I, which has at each end a beveled flange, i, bearing at one end upon a similar flange, a^5, formed upon the body, A, and at the other end upon a beveled ring, A', screwing upon a threaded portion of the body, whereby it can be adjusted to take up the wear of the flanges i. The body A is cut away at the point where the barrel is inserted, leaving wings connecting the front end of the body with the main portion and exposing the barrel to enable it to be manipulated. A spring detent, K, holds the barrel when adjusted. This barrel is provided with four delivery tubes, two of which are shown at L L^2 in Fig. 2. The barrel is hollow for the sake of lightness, and the tubes are screwed into holes provided for them in the ends of the barrel, having shoulders to bear against the ends. A dash plate, M, is fitted into a seat in the body A, adjacent to the barrel, and is held stationary by a pin, m. In the lower part of the dash plate is a hole in line with the combining tube H and the lowermost delivery tube, the ends of the other tubes being covered. The delivery pipe is provided with the usual check valve N. The chamber 4 has an overflow pipe, O, leading out of it, provided with an inwardly opening valve, P, fastened to a lever, p, the end of which is connected by a rod (not shown) with the eye d^2 on the handle d', so that the opening of the steam valve D will close the overflow valve P.

When it is desired to feed hot water the steam is caused to pass through a pipe arranged in such a manner that it is in contact with the water. To accomplish this the steam pipe B', leading from the source of steam supply and controlled by a valve, b, enters the lower part of the

chamber 3, where it is formed into a coil, B^2, to expose a greater surface to the water, and then passes up into the chamber 2, terminating in a spout, B^3, opposite to the inner end of the steam nozzle F. its velocity or the efficiency due to the velocity for forcing the water into the boiler. The coil B^2 is removable, being coupled to the lower end of the spout B^3 by means of the flanged ring b' and by a similar ring, b^3, to a threaded neck formed integral with the wall of the chamber 3 at the point where the pipe B′ enters. The wide-mouthed coupling A^3 permits the coil B^2 to be removed when the injector is to be used for cold water only; or in such case the injector may be made without the pipe B′, coil B^2 and spout B^3.

This injector is the design of H C. Reagan, Jr., and is made by the Hess Machine Works of Twenty-fifth and Callowhill streets, Philadelphia.

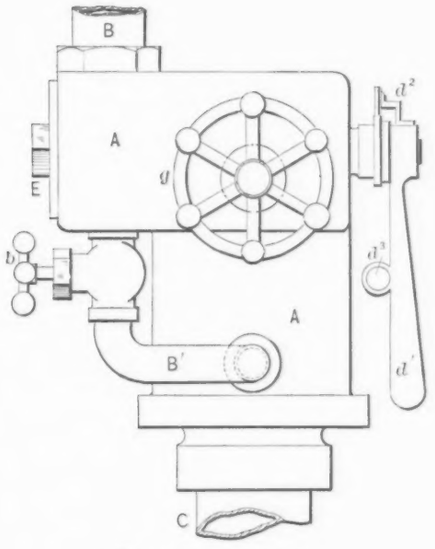


Fig. 1.—Rear Elevation.

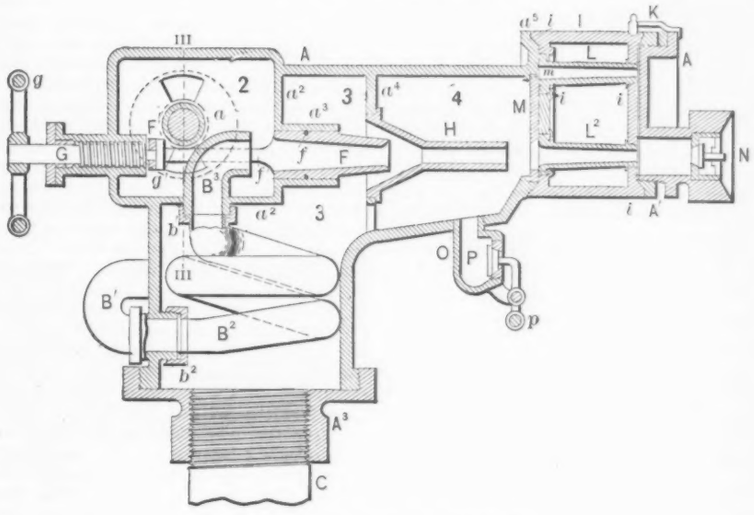


Fig. 2.—Longitudinal Vertical Section.

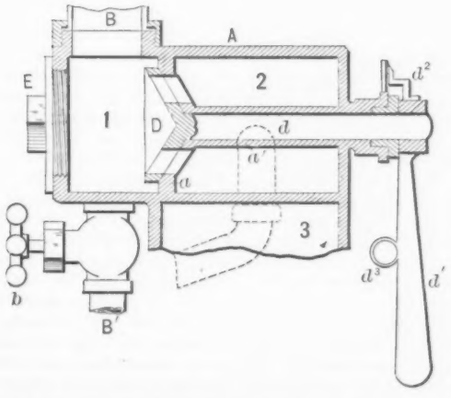


Fig. 3.—Vertical Cross Section on Line III III of Fig. 2.

THE REAGAN INJECTOR.

The steam entering the pipe B′ at the temperature due to the boiler pressure is cooled by the water surrounding the coil B^2 to a point where it is readily condensed by warm or hot water, but without losing

METAL-CUTTING TOOLS.—VII.

The Finishing Cutter.

The finishing cutter, if accurate work be required, should be very carefully fitted into the bar slot, so as to always occcupy the same relative position when keyed into place. In form it is much like the gib of a connecting rod stub-end, except that it is proportionately much wider. It should be shouldered down on both ends to a depth about equal to its thickness, and overlap the bar in the direction of the feed—the necessary flats at each end of the slots being provided for the purpose. On the accuracy of the fitting of the cutter shoulders to these flats will depend the accuracy of size of the hole the cutter will make, and as this is usually required to be standard, to be followed by the hand reamer, the importance of careful fitting may be appreciated. After this is accomplished the key should be driven snugly home and the bar placed in the lathe for turning the cutter. The leading edge and ends only require to be thus finished, and the diameter should be made only enough larger than finished size to allow for finishing out the tool marks by hand. Before taking the cutter out of the slot after turning one end should be marked, as also the bar at end of slot to which it belongs, as it must, of course, always be inserted in the same way.

After hardening (the temper may be from full hardness to dark straw color) the cutter should be carefully cleared on the ends by means of an oil stone, as very little clearance is required or allowable, as these ends act as the guide and determine the diameter of the cut. The edge clearance will be governed by the material of the work and the pitch offered, but it must not be excessive, or the tool will work badly. The amount of stock left for this finishing cut must be very little, as its function is properly that of smoothing and sizing only, and the resultant hole should be as clean and smooth as after the seamer, and perfectly round and straight. Having so large an amount of guiding surface, the cutter may be used a long time without the size decreasing appreciably. When the facilities are available, it is best to file or turn the cutter somewhat above size, and finish by grinding with a fine wheel after tempering. The end clearance, however, should always be made by hand as described.

Two forms of cutter are used for squaring or finishing the ends of holes. The first, the roughing cutter, must be made long enough to reach as far out from center as it is desired to finish, and still leave a full bearing in the slot. It must fit tightly sidewise, and be keyed as tightly as possible to admit of its being tapped out with the hammer at each revolution, which is the method of feeding. There should be a backward projecting point, so that the body will be clear of the cut. The shape of point, its clearance, &c., like that of the roughing cutter for inside work. The body should not be hardened, as it is unnecessary, and would cause risk of breakage from the transverse strain. The temper of point may be straw color, but if made too hard there is danger of its breaking, on account of the rather violent means employed in feeding.

The finishing cutter is made double ended to give two opposite working edges.

It should be tightly fitted and keyed in the slot and squared off in the lathe either by turning before or grinding after hardening. The face should be perfectly flat, no lip or groove being necessary, and unless the edge clearance be very slight it will be sure to chatter badly, the result being a surface beautifully decorated with radial corrugations, more ornamental than desirable. A very slow speed is necessary, and the feed steady and firm, but without forcing. The temper may be quite hard for short cutters, but much softer for those of greater reach. The edge should be kept keen by the use of oilstone, not only with a view to clean, smooth cutting, but also that if dull it is apt to refuse to cut until the feed pressure is so heavy as to cause the tool to dig in and possibly spoil the work when it does take hold. After the necessary amount of stock is cut down the cutter should be allowed to revolve a few times without feeding for the purpose of completing the finish, which, if the cutter be in proper order, will be as bright and smooth as if polished with emery.

Among the special tools used with this bar may be mentioned those for chambering or recessing in the bore, external flange turning, internal and external screw thread cutting, chamfering, &c., *ad infinitum*. On every large work, particularly for bores whose length is too great for the use of the heavy overhung bar first described, the self-feeding bar is used. For work in the lathe, it is placed on centers, and should therefore be centered deep and true to the proper angle, to give sufficient bearing to insure against its changing by wear during a long cut, the result of which would be a taper bore. Owing to its large diameter the bar may be (and generally is) made of cast iron, though wrought iron and mild steel are frequently used. A deep spline with semicircular bottom is planed from end to end, and in this is placed the feed screw. The latter, usually square threaded, is cut its entire length and carried by a bearing at each end of the bar. Its position in the spline should be low enough to insure its clearing the circle of periphery of the bar. At the driven end of the bar the feed screw should be held in position longitudinally by means of a collar on the inside of bearing and a nut and washer on the outside. At the other end is keyed the feed wheel—usually what is known as the star feed.

The Star Feed.

It is a wheel minus the periphery, and the arms act in the manner of a ratchet, by striking a stationary stop at each revolution of the bar, which indexes it around until the motion carries the arm clear until the next revolution, when the next arm comes into play. This, of course, turns the screw part of a revolution, according to the number of arms in the star wheel, and the duration of interval, during which the latter is held by the stop. The variations of feed are made by adjusting the position of the stop nearer or farther from the center, so as to increase or decrease the duration of contact with the arm, and where a greater difference is required, by changing the wheel for one having a greater or less number of arms, the greater number, of course, giving the slower feed. It is usual to have a sufficient number of these wheels to give all necessary changes of feed, though one set will generally be sufficient for a number of bars. This method of feeding has one objectionable feature, in that it is intermittent and forces the cutter along the full pitch in a very small portion of the revolution instead of being continuous, as is the correct and usual manner of feeding on other kinds of work. Its chief recommendation is its simplicity and cheapness.

A continuous feed may be very easily made by means of a stationary internal gear, set concentric with the axis of the bar and a system of change gears for different pitches of feed, to be used on the screw. This, of course, necessitates the use of a slotted arm for carrying an idle or intermediate gear to compensate for the changes of diameter of the screw gear. A very simple means of carrying the stationary gear is by making it with a clamp hub bored to fit the dead spindle of the lathe. This insures perfect concentricity and dispenses with any necessity for adjustment, besides holding it rigidly in position. The cutters are carried by a circular head, made to slide on the bar, and having a key to prevent its turning, the latter sometimes having an independent spline on the opposite side of the bar from the feed screw, but generally using that in which the screw is seated. The head also has a long nut through which the screw passes and by means of which it is fed along the bar. The length of bearing in the head should be sufficient to prevent any possibility of its becoming jammed on the bar from the application of the motion on one side only. Also, the fitting must be so close as to prevent any possibility of lost motion, which would affect the character of the work.

In different positions in the head are a number of seats for the various cutters used in the numerous operations for which the bar is adapted. It is usual, where considerable stock is to be removed, to use two or more cutters at the one time, each one being set the proper amount deeper than the one preceding it, so that all will have the same depth of cut. Where the core is fairly true this plan is a very good one, and particularly where three equally spaced cutters are used, as they have a steadying effect on the bar, besides feeding the three cuts at one pass. If the core be badly out of center, however, so that most of the cut comes on one side of the bore, it is much better to use but the one cutter, as it enables the entire stiffness of the bar to be applied to resisting the springing tendency of the one-sided cut, and by making three passes instead of but one, the eccentricity is decreased a given amount each time, and will generally effect the truing up by the time it is necessary to start the finishing cut.

The roughing cutters may be of any desired form of body—that best adapted to the holding device in head being usually selected. The cutting edges, however, should conform to the general requirements of those already described—modified, of course, to suit the kind of material upon which they are to operate. The finishing cutters should also be similar, as to cutting edges, to the double-end cutter referred to in connection with the slotted bar. In starting the finishing cut the size must be calipered at a point where the strain of the entire cut comes on the bar—that is, it will not answer to caliper where the cut starts in, after making one or more attempts, as, the cut being so much lighter at this point, there will be correspondingly less spring to the bar, and consequently it will bore larger than after the full cut has been reached. The proper allowance to make for this point is entirely a matter of judgment, dependent on the skill of the workman. It is important that the cut be not allowed to run further than is absolutely necessary to enable the size to be measured, as if several false starts are thus made the effect on the uniformity of the finished bore will be very perceptible. Of course, for engine or other cylinders in which the heads are made of larger diameter a suitable counterbore is provided, the size of which does not need to be so exact as that of the bore itself, and this will always give ample space in which to start the finishing cut for the latter.

It is of the utmost importance that, after once starting, the cut should be kept running at uniform speed of revolution and feed until entirely through the bore, as upon its continuity will depend the uniformity of size necessary in this class of work. Any stoppage or change in speed will invariably result in an offset at the point where it occurs, no matter how stiff or accurately fitted the bar and its appurtenances may be. This feature, of course, applies to boring with any form of bar or tool, and the importance of providing against its occurrence may be appreciated from the fact that where the inequality of size is once established it becomes a matter of extreme difficulty to correct it by subsequent manipulation, unless a sufficiently heavy cut be run the entire length of bore, thereby increasing the size beyond that originally intended.

The Shell Reamer.

Where extreme accuracy and smoothness of bore are desired, it is sometimes the practice to use a second head, in the form of a shell reamer. The body is made of cast iron and in all respects like the regular head, except that, in place of the boring cutters in the latter, there are seats planed the entire length, and the reamer teeth set in, similar to those in the ordinary shell reamer. Of course, this will not pay unless there are a sufficient number of holes of the same size, to be finished, to warrant the expense of the tool, as it will answer for the one size only, or, if made of the adjustable type, by tapering the teeth and their seats, and even by providing several sets of the former, no very great range of sizes is possible. For the heaviest class of work, such as the bores and flanges of marine, pumping and blowing-engine cylinders, the vertical type of bar should be used. The necessity for placing the cylinders on end during the operation is owing to the fact that, if placed in a horizontal position, the mere weight of the casting will cause it to spring sufficiently to cause the bore to flatten to a very appreciable extent, and an "oval cylinder" will be the result. Two forms of mill are used for the work. The most usual is that in which the form of bar, &c., last described is stationary and the work is carried on a revolving table. In the other the work is stationary and the bar is rotated by any suitable mechanism. The latter rig is best suited to special work, where temporary facilities are required, as the casting may be merely leveled up on the floor, in any convenient location, and a temporary hole provided for the tail bearing and end of bar. The drive may be led to the gearing at the upper end of the bar by means of rope belting, which will admit of turning as many corners as required by the relative positions of line shaft and bar.

It not infrequently happens that boring must be done in work for which the power drive is not available or convenient. In this case it may be done by hand power, by the use of crank and suitable gearing. The bar is carried in bearings bolted or clamped to the work and carefully adjusted to the circle of hole laid out on casting at both ends of bore. This adjustment is best made by using a bent scriber keyed into cutter slot in bar, and by turning the latter to all points in the circle the setting may be made extremely accurate. While this method of boring might appear to be extremely crude and incapable of giving very satisfactory results, such is not the case. Of course, all depends on the skill of the workman, but if this be adequate the work will be as true and clean—and not so very much slower—as can be done in the best boring machine.

Portable boring machines have of late years come into very general use—probably as a matter of development from the introduction of the Flanders cylinder borer—the pioneer of this class of tools. They are made for use by either hand or power driving. Convenient devices are provided for attaching and adjusting them to the

work—also a full set of bars, cutter heads and other accessories for adapting them to almost any class of work. For boring engine cylinders and rotary valve seats, without removing the parts from position, and other operations of a similar character, they are a very useful and efficient tool, and effect a large saving in cost of the work.

The Kenderdine System of Burning Crude Oil.

The Kenderdine crude oil burner (shown in Fig. 1) consists of a tube divided into two compartments by a flat horizontal plate. A side hole is connected to the oil supply, and allows the oil to flow over the surface of this horizontal plate The oil spreads out in a thin film, and a current of air strikes the plate from above, breaks up the oil and carries it out of the mouth of the burner in the form of mist. One end of the burner is connected with the air supply, and the other projects through the furnace door about 1 inch. The horizontal plate divides the air blast into two streams, one above the plate—the atomizing current—and one below, which furnishes the necessary amount of air for combustion. A vertical slide regulates the quantity of air supplied, which varies with the amount of oil consumed.

It is stated that these burners can atomize from half a gallon to 15 gallons of oil per hour each. They remain quite cool while in operation, and are noiseless, features that will be appreciated by those who have had experience with high pressure devices for the same purpose. An ordinary rotary fan blast is sufficient for this work, three ounces of pressure being ample.

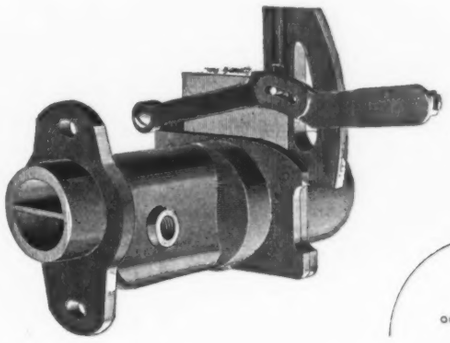


Fig. 1.—Perspective.

The method of supplying the oil from the main reservoir to the burners is shown in Fig. 2. A pump raises the oil from the reservoir to a small overflow tank placed about 4 or 5 feet above the level of the burners. The oil rises in the two branches—the burner and stand pipe—simultaneously, and all surplus oil raised by the pump and not consumed by the burners returns to the reservoir by means of the return pipes. The object aimed at is to keep the oil constantly moving in the pipes and thoroughly agitated in the reservoir.

The effect is to avoid thickening of the oil in winter time, and to secure uniformity in the quality of the oil by the constant stirring. As a result, it is found that no water remains in the pipes, and the fires are uniform. A governor, consisting of a diaphragm, supported at one end of a lever, is placed on the end of the overflow tank, and is connected by a pipe to the air blast. The other end of the lever is attached to a rod running down to a valve. The *modus operandi* is as follows: When the air blast is started, the pressure forces the diaphragm down, raising at the same time the other end of the lever, and therefore the rod and valve. The oil then travels to the burner, as described.

As soon, however, as the air supply ceases from any cause whatever, the diaphragm rises and drops the lower valve, allowing the oil to flow direct to the reservoir without going to the burner. By this means the danger of flooding the furnace with oil is obviated in the event of the fan belt suddenly breaking, and, on closing down, all the oil in the pipes immediately flows back to the reservoir. This feature is specially arranged to comply with the rules of the Board of Underwriters.

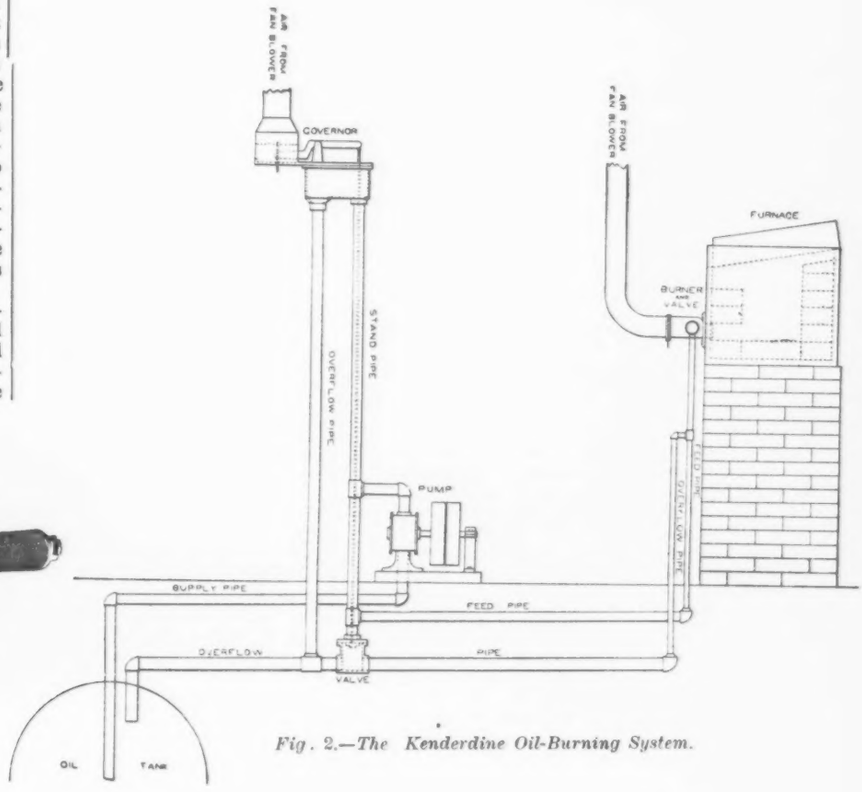


Fig. 2.—The Kenderdine Oil-Burning System.

THE KENDERDINE SYSTEM OF BURNING CRUDE OIL

This system, which is being introduced by the Kenderdine Hydro Carbon Company of Philadelphia, is in use at Fayette R. Plumb's Edge-Tool Works, Frankford; Edge Moor Bridge Works, Wilmington; Disston & Sons' Saw Works, Philadelphia; Baldwin Locomotive Works, Benedict & Burnham Mfg. Company, and Holmes, Booth & Hayden.

The recent growth of the foreign commerce of Philadelphia excites high hopes in that city. The *North American* says: "The decline in the volume of our exportations of wheat and oil was some time ago arrested, and during the past 12 months the shipments of those commodities from Philadelphia have enormously increased. During the first nine months of this year 23 per cent. of all the grain shipments from New York, Baltimore and this port went from Philadelphia, while similarly our percentage of the petroleum exported rose from 26.5 in 1889 to 38.20. A like movement has taken place in sugar, and altogether the commercial prospects of our city were never brighter than they are to-day."

The Columbus festival taxed the capacity of New York City in a variety of ways. As nearly as can be estimated, fully half a million of strangers visited the city, and when a much larger number of native citizens joined the throng of spectators to witness the evolutions of 51,000 men in the military procession, the streets on the line of march were thoroughly packed. The hotels were so much crowded that they were in some instances compelled to turn away hundreds of applicants. The manager of the elevated railroads says that on Wednesday they carried 1,075,000 passengers, as compared with 1,000,000 carried April 30, 1889, the day of the Washington Centennial parade. One thousand cars and 300 locomotives were constantly employed. Travel on the Brooklyn Bridge was the heaviest since its opening day, May 24, 1883. The number of travelers, including pedestrians, is roughly estimated at 300,000. In point of numbers, at least, the Columbus parade was the largest ever held in this city. In the Washington Centennial parade of June 30, 1889, there were 46,254 men in line, while the number who marched on August 8, 1885, at the funeral of General Grant, was 40,000. The naval pageant made a magnificent show of the engines of war.

The exports of breadstuffs from the United States during the three months ended September 30, 1892, amounted to $50,609,195—a decline of $26,085,627 in comparison with the same period of 1891. By this large decline of exports of breadstuffs it is seen that the consumers of Europe are recovering from the evil effects of the bad harvest of last year.

Geared Electric Hoists.

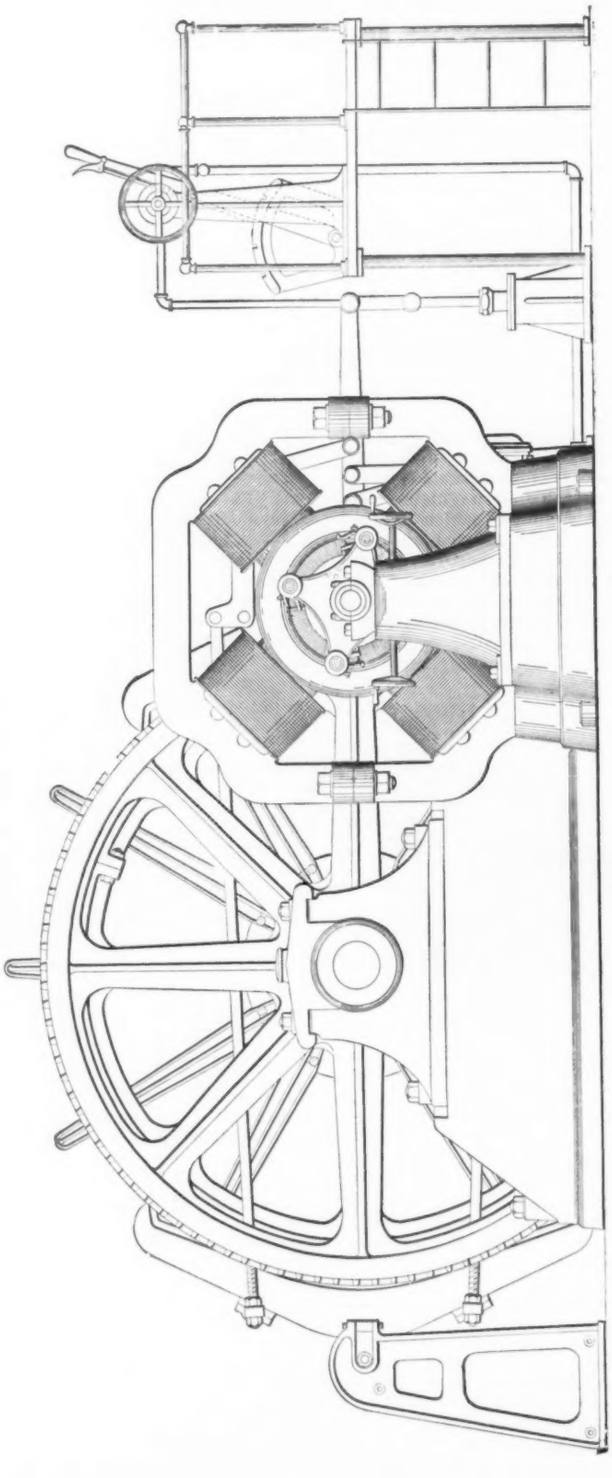
The accompanying plan and elevation represent a geared flat-rope electric hoist for a double compartment shaft. These hoists are designed for heavy loads at high speeds and are built by the Thomson-Houston Electric Company of 620 Atlantic avenue, Boston, Mass., of any desired capacity. In this hoist two standard multipolar motors are used, each geared to the reel shaft independently of the other. Both gears are keyed to the reel shaft, the reels running loose, and are provided with clutches for operating. Post brakes are used and indicators are attached to the reels. When desired, both clutches and post brakes are operated by compressed air, a small air compressor driven by an electric motor being provided for the purpose. All levers are arranged within easy reach of the operator, so that one man can attend to both reels and brakes without difficulty. A reversing switch is provided, so that the load can be lowered at any desired speed by the motors, under complete control of the operator. These hoists are made in standard sizes ranging from 300 to 1500 horse-power, as usually rated; diameter of reels from 42 to 54 inches; number of feet of rope the reel will hold, 1500 to 2500; average weight hoisted from maximum depth, 10,000 to 20,000 pounds; average hoisting speed per minute, 1000 to 2500 feet.

The Thomson-Houston Company, in an elaborate catalogue just issued, "briefly mention the most striking advantages offered by the use of electricity as compared with steam. The most trying time for a hoist is the moment at which it starts to raise the load. With steam hoists, in order to avoid the frequent occurrence of having an engine on a dead center when ready to start, two engines on a common crank shaft, with cranks at right angles, are usually employed. Even with two engines, the maximum starting effort that can be relied upon at any time is represented by the power of but one engine, as the other may be "on the center." An electric motor has no centers; it is always ready to start to the best advantage. At the moment of starting, when the severest effort is needed, a heavy current far beyond its rated capacity may be turned into the armature of the motor for a few moments, until the load is started, when the amount of current for which the motor is intended will suffice to raise the load. In other words, a much better torque or starting effort is possible with a single electric motor than with a double engine hoist of the same rated horse-power. This important advantage at once becomes of practical value in giving electric hoists greater capacity, all conditions being equal, than steam hoists.

"An electric hoist can also be much more quickly and easily controlled, the simple reversing switch replacing the cumbersome reversing lever and quadrant, which often takes the strength of the operator to move.

"When part of a general electric system in a mine, the advantages become even more manifest, as the location of the hoist with relation to the central power station is of small moment, as only wires are required for the transmission of the power. Long and expensive steam or compressed air pipes, with the loss consequent upon their use, are thus done away with; or in case the distance be too great for using steam, a separate plant is saved. In underground work the advantages are still more striking, electricity making the use of a winze hoist possible in places to which a steam or air pipe could not well be led. In addition to this the hot steam pipes in the mine are done away with and much greater economy in the expenditure of power secured.

"In the matter of attention and repairs we have, simply, the two long self-oiling armature bearings of the motor, requiring practically no attention and but little oil, as compared with the two link-motion steam engines with their many bearings and adjustments, expensive repairs, heat and noise, and requiring a skilled engineer for their proper operation."



GEARED ELECTRIC HOIST.—ELEVATION.

At Pittsburgh last week the Grand Jury in session in that city returned true bills against H. R. Barnes, John Carr and others for conspiracy. All the persons indicted are members of the Builders' Exchange of Pittsburgh, the plaintiff in the case being Thomas Buchanan, a contractor of Pittsburgh, who claims that in consequence of members of the Builders' Exchange refusing to sell him building material he had to give up a large contract for the erection of a building after it was partially completed. The plaintiff claims that it was a preconcerted action on the part of the Builders' Exchange which compelled him to forfeit his contract. The case will come up for trial in a short time and the outcome will be watched with considerable interest by every person who is identified with the building trades in any way.

French Board of Trade returns for September show that imports decreased $10,000,000 and that exports increased $4,219,800.

The Elimination of Sulphur from Iron.*

(*Continued from page* 683, *October* 13.)

Sulphur in Acid Steel-Making Processes.

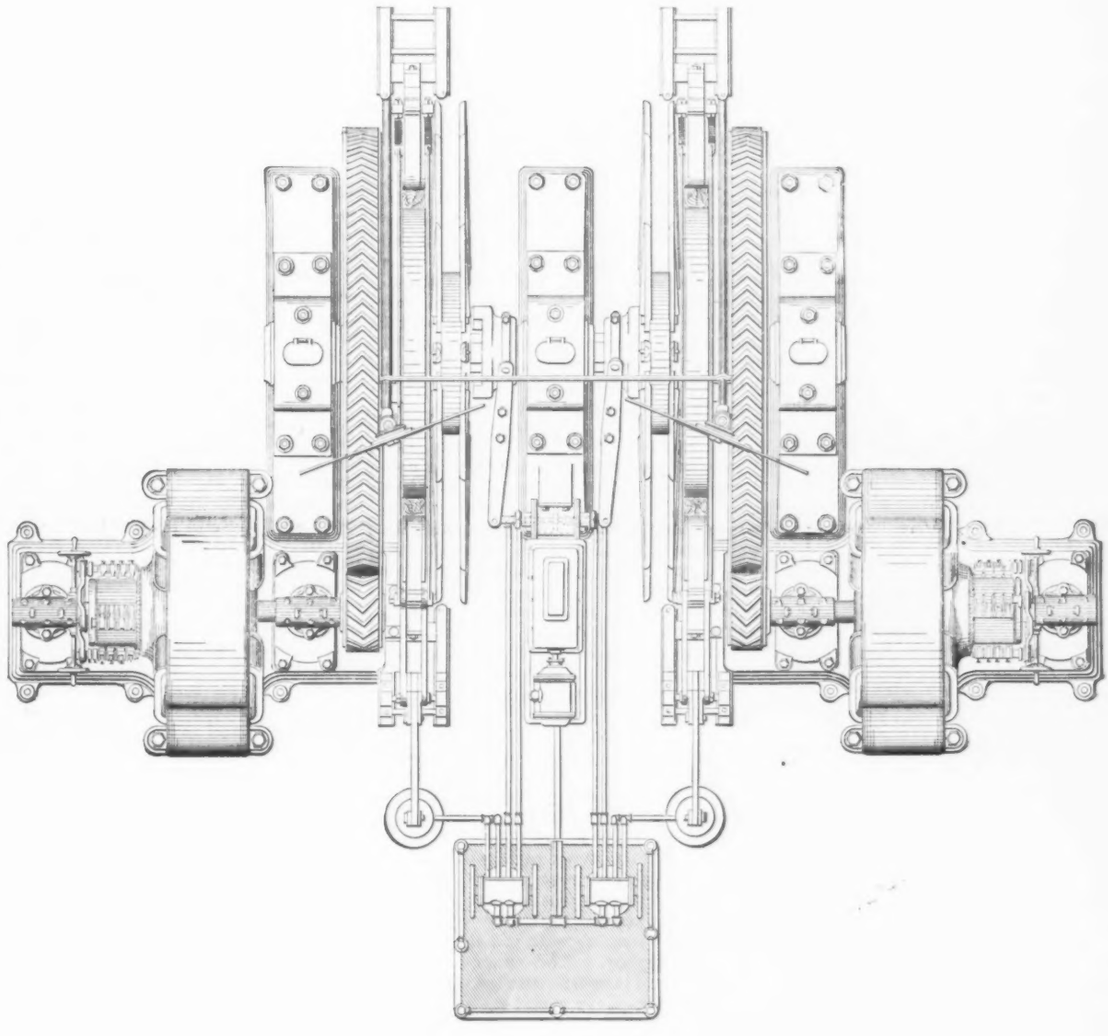
At the various works where I have had the opportunity of testing the metal before and after blowing in the converter, it has always been shown that there was not less quantity in the steel. When the metal is melted in a cupola furnace, preparatory to blowing it, sulphur is absorbed from the fuel to the extent of from 0.01 to 0.06 per cent., the quantity depending on the amount and quality of the coke, and to a certain extent on the proportion of limestone used as a flux; and it is a fact that in ordinary English practice, when working in this way, the sulphur is higher in the steel than it is in the original metal. Howe says that White, of the Bethlehem Steel Works, America, found more sulphur in the steel than was in the metal run into the converter—no doubt the result of concentration and absence of any elimination. Sir L. Bell, in blowing Cleveland iron at Spennymoor, found no elimination of sulphur. Baker, at Sheffield, found that the metal charged, containing 0.107 per cent., was reduced to 0.093 per cent. at the termination of the blow. At Seraing, metal containing 3.75 per cent. Mn and 0.04 per cent. sulphur suffered no diminution of sulphur during conversion in the Bessemer converter. If we take into consideration the concentration occasioned by the combustion of some of the constituents of the metal, it would appear that, although the sulphur remains the same in relation to the mass of metal and steel, there must be an elimination equal to loss of metal in blowing, and this amounts to about 10 to 11 per cent. This loss may be accounted for by the effect of manganese in the metal, either naturally present or added with the spiegel and ferro With regard to the theory that silica oxidizes the sulphur during the first part of the blow, I am afraid we must abandon it, first, because in reality there never is free silica present when the silicon is oxidized; for it is well known that the magnetic or other oxides at first produced near the tuyeres are the main agents at work in removing silicon, and this they do at their own expense, as they are partially reduced iron and silicate of iron, and not free silica resulting; and, secondly, for reasons previously advanced, even if free silica were present, the temperature at the early stage of the blow is not sufficiently high or the time of exposure long enough to be at all comparable with the conditions of the experiments made in Dr. Percy's laboratory.

Sulphur in the Open-Hearth Acid Process.

Snelus, Hardisty and many other observers have noticed that, in the acid open-hearth furnace, there is no elimination of sulphur, but that sulphur is actually absorbed from the furnace gases, and thereby materially increased in the steel. My experience is that in working with the purest material, containing only 0.01 per cent. sulphur, the steel contains from 0.025 per cent. to 0.040 per cent. sulphur. Not only is sulphur absorbed from the sulphurous acid in the furnace gases, but if it is present in the ore charged to oxidize the bath a portion at least will pass into the steel; it is necessary, therefore, to use ore free from sulphur for this purpose. Willis found that 30 per cent. of the sulphur in ore containing sulphate of baryta passed into the steel. (*Iron and Steel Journal*, 1890.) The silicious slag always present in contact with the bath of metal approximates closely to what is first produced in burning out the silicon in a Bessemer converter, and the fact that it has no action whatever on the sulphur in the metal demolishes completely the theory that it has any effect in that direction in the converter.

SULPHUR IN THE BASIC PROCESSES.

Herr Massenez and Professor Finkener in Germany, and nearly all observers in



GEARED ELECTRIC HOIST.—PLAN.

* Read at the Liverpool meeting of the Iron and Steel Institute.

this and other countries, are agreed, as indicated by the analyses they have published, that there is a notable quantity of sulphur removed in the basic Bessemer converter. Professor Finkener found that in blowing metal containing 0.08 per cent. and 1.0 per cent. manganese, in two and a half minutes it was reduced to 0.047 per cent., after which it steadily increased till it amounted to 0.055 per cent. at the end of the blow; but after the addition of spiegel and ferromanganese, it fell to 0.045 per cent. At Hoerde, in blowing iron containing 0 42 per cent. sulphur and only 0 41 per cent. manganese, the sulphur was not apparently reduced till the after-blow was half completed, when it was reduced to 0.26 per cent., and to 0.15 per cent. after the addition of spiegel and ferromanganese. At Eston, when ordinary Cleveland iron was blown, I found that where only 0.05 per cent. sulphur was originally present, it remained constant, but that in blowing metal with 0.16 per cent. sulphur it was steadily eliminated till it reached 0.10 per cent. Kupelwesser found that in blowing metal at Hoerde the sulphur increased as the conversion progressed from 0.152 per cent. to 0.206 per cent., but that it diminished to 0.133 per cent. after adding the spiegeleisen and ferro manganese. At Witkowitz he found the same amount of sulphur in the steel as was present in the pig. Wedding (154) states that at Creusot, by continuing the blow after the phosphorus is removed, the sulphur in the pig is reduced from 0.2 per cent. to 0.03 per cent. C. H. Ridsdale informs me that, after long experience, he has found that at the Northeastern Steel Works the sulphur on an average is diminished by about 0.03 per cent. from metal containing some 0.09 per cent., the initial amount of manganese being about 1½ per cent. Sir L. Bell gives analyses made in his laboratory of the results obtained by blowing white iron at Hoerde, which show an elimination of 73 per cent. of the sulphur present. This, however, must be taken as exceptional. On examining all these results, excepting those of Kupelwesser, we find that when the proportion of sulphur is considerable the amount eliminated is much greater than when present in less amount; thus, without taking into account concentration by loss in blowing:

With 0.42 per cent. in the pig, the steel contains 0.15 per cent., or 64 per cent. less.
With 0.307 per cent. in the pig, the steel contains 0.85 per cent., or 73 per cent less.
With 0.160 per cent. in the pig, the steel contains 0.10 per cent., or 37 per cent. less.
With 0.09 per cent. in the pig, the steel contains 0.06 per cent, or 33 per cent. less.
With 0.05 per cent. in the pig, the steel contains 0.05 per cent.. or no change.

Allowing, however, for the loss in blowing, the proportions given above must be increased by about 15 per cent. more or less. Wedding* says the fact that manganese addition at the termination of the blow caused a diminution of sulphur need not create surprise, "since it is well known that the manganese induces a removal of sulphur." Also, "that S actually volatilizes from the vessel is indicated by the fact that the slags from highly sulphurous charges contain no proportional increase of CaS, so that the elimination of S from the metal exceeds what is thus accounted for in the slag."

SULPHUR IN THE BASIC-HEARTH PROCESS.

Mr. Harboard, in his paper on the basic-hearth process to this institute, shows that in working charges containing high sulphur the amount eliminated varies between 45 per cent. and 50 per eent.

	Metal. Per cent.	Steel. Per cent.	Removed. Per cent.
Sulphur	0.23	0.125	45
Sulphur.....	0.18	0.089	50
Sulphur...	0.40	0.200	50

Mr. Hardisty has kindly given me the following information obtained as the result of his experience:

	Metal containing. Per cent.	Steel containing. Per cent.	Eliminated. Per cent.
Sulphur.....	0.22	0.15	31
Sulphur.....	0.15	0.11	26
Sulphur.....	0.10	0.065	34
Sulphur.....	0.07	0.050	30
Sulphur.....	0.04	0.025	37
Sulphur	0.025	0.015	40
Average..		....	33

Yet Wedding* says: "It is to be noted that the basic open hearth process removes little or no S, so that its product averages relatively more sulphur than does converter metal." Wedding also gives results, showing that near the end of the process the S increases in the case quoted from 0.067 per cent. to 0.087 per cent. He also says: "Apparently open-hearth metal is less affected in its physical qualities by S than converter metal." In discussing the changes which occur in the basic Bessemer process Professor Finkener states "that it is impossible to remove sulphur as sulphate of lime, for that body is reduced by iron, sulphide, and oxide of iron and lime resulting, and that other sulphur compounds, when they are formed, are decomposed by iron." Wedding, page 154, says: "If the action of sulphur in the blast furnace can be compared to its action in the acid and basic Bessemer process, it follows that a sulphur separation can take place with calcium and manganese, because the oxidizing effect of the oxygen fails; in the acid process the oxidizing effect of the oxygen adds to that of the free silica, while in the basic process these two conditions fail, and therefore a low sulphur content conditions a favorable result. Later, however, Wedding says "that in converting basic iron in a converter the S is not reduced till the after-blow." He says: "Many special investigations have proved that during the dephosphorization manganese returns to the metal bath, where it effects an elimination of sulphur."* Now, with all these facts before us, and the theories of Wedding and Finkener to guide us, and the fact that lime alone and calcareous slags are capable of removing sulphur from iron, it would seem that what desulphurization is effected results from one or a combination of four causes: 1. That the manganese added in the metal in passing out may carry some sulphur with it. 2. That the manganese reduced from the slag during dephosphorization effects an elimination of sulphur. 3. That the calcareous slag in contact with the upper surface of the bath containing carbon may absorb sulphur. 4. That some of the manganese added in the ferro does, undoubtedly, leave the bath again, carrying with it a small quantity of sulphur. The changes during elimination of the sulphur in the basic process, however, have not yet been thoroughly explained, and the subject is worthy of more attention.

ROLLET'S PROCESS.

Rollet has made many and exhaustive experiments to desulphurize iron. His process consists "in melting pig iron and maintaining it at a very high temperature under a double action, slightly reducing and slightly oxidizing, in the presence of a slag obtained by admixtures of limestone or lime, iron ores and fluor spar, in proportions depending on the quality of the pig or castings employed." He says "the elimination of the sulphur is complete up to 99 per cent., and even more." The process is conducted in a jacketed or basic lined cupola furnace, and coke is used as a fuel; a large excess of lime and from 2½ to 48 per cent. of fluor spar is used, so that the slag does not contain more than 2 per cent. silica. I have not had an opportunity of investigating this process, and cannot, therefore, explain why it is that the sulphur passes out of the slag. As, however, both Mr. Saniter and I have found that lime alone will desulphurize iron, it is probable that the very calcareous slags employed are in greatest measure responsible for the elimination.

HERR MASSENEZ'S PROCESS.

This process has been so recently described before this institute that it will not be necessary for me to more than briefly describe it. Practically it consists in mixing together, in a suitable metal mixer, pig iron, poor in manganese and high in sulphur, with iron containing a larger percentage of manganese and little sulphur; the manganese of the one charge acting upon and combining with the sulphur of the second; the sulphur so formed separating from the metal and rising to the surface by gravity. The fact that manganese, when added to metal containing sulphur, caused elimination of that element was first noticed by Caron, who melted sulphurous iron with ferro (6 per cent.) manganese, and eliminated by that means 90 per cent. of sulphur. He also confirmed Parry, that manganese in the blast furnace caused the absence of sulphur in pig iron. Percy, on discussing Caron's remarks on the effects of manganese on pig iron says: "It would appear that the Mn acts as a medium through which the sulphur is oxidized and eliminated in the state of SO_2." Caron, however, is of a different opinion, and concludes that without any oxidizing action S disappears from cast iron in presence of Mn. Ponsard states that 80 to 90 per cent. of S may be removed from pig iron by stirring ferromanganese into the ladle at the time of running: 2.6 of Mn remove 1 of S; the S is found in the slag. Edward Riley, in 1877, described an experiment of his, in which he melted cast iron containing 0.207 per cent. of sulphur with 10 per cent. of ferromanganese in a crucible, and found that the sulphur was reduced to 0.037 per cent., but I have failed to find any explanation as to the change or reaction which was effected. Walrand melted sulphurous iron and spiegel in separate crucibles, the latter under lime, and poured the metal into the crucible containing spiegel, and on stirring them together sulphurous acid was evolved, and the mixture of metals caused a reduction of the sulphur from 0.50 to 0.06 per cent.

ANALYSES OF METALS BEFORE AND AFTER PASSING THE MIXTURE AT HOERDE, MARCH, 1892, BY E. M COOK.

	Metal from three furnaces.			After passing through mixer.
	Per cent.	Per cent.	Per cent.	Per cent.
Iron	92.65	93.40	91.18	92.41
Combined carbon.....	3.00	2.80	3.05	3.05
Manganese	1.72	1.30	2.50	1.68
Silicon	0.46	0.20	0.80	0.69
Sulphur.....	0.15	0.20	0.08	0.04
Phosphorus.....	2.02	2.10	2.39	2.13

Mixer Slag.

	Per cent.
Silica	32.30
Iron.....	5.80
Manganese.....	33.46
Sulphur.....	5.75

Ordinary foundry iron, containing manganese, after melting in a cupola and pouring into large molds, in which it remains for a considerable time in a fluid condition, is liable to have a concentration of sulphide of manganese near the highest or most elevated part of the casting. This fact was, I believe, first noticed by my former assistant, Harold Ridsdale, who

* *Iron and Steel Journal*, 1890, vol. II, p. 539.

* *Iron and Steel Journal*, 1890, vol. II, p. 539.

sent me the following analyses of the upper and lower part of a large ingot mold, viz :

	Upper part. Per cent.	Lower part. Per cent.
Sulphur	0.75	0.112
Manganese	1.35	0.547

Strange to say, this large quantity of sulphur and manganese did not cause the metal to be white, from which it may be assumed that when the manganese and sulphur dissolved in metal are combined together they do not exert the same influence in preventing the carbon from assuming the graphitic condition as when in combination with the iron.

Saniter's Process.

Essentially this process of desulphurizing metal or steel in the basic open-hearth consists in the use of about ½ hundredweight of crude calcium chloride (which is added to the furnace when the charge is melted) per ton of steel, in conjunction with an excess of lime over and above what is usually employed. So far as the working of the charges is concerned in other respects, there is no deviation from ordinary practice. The amount of limestone added with the pig and scrap is greater than in ordinary work, and as soon as the whole of the required amount of calcium chloride is added, when the charge is melted, lime and mine are thrown in as required in the usual way. On February 9 of this year I visited the Wigan Steel Works, and was present during the working of several charges of iron treated by this process, and obtained the following result on analysis, viz.:

MATERIAL USED IN THE FURNACE.

Pottery Mine.

	Per cent.
Peroxide of iron	71.80
Protoxide of iron	9.70
Phosphoric acid	1.50
Siliceous matter	4.00
Sulphur	0.30

Lime.

	Per cent.
Lime	93.00
Magnesia	1.05
Alumina	0.55
Peroxide of iron	trace
Silica	1.25
Sulphuric acid	0.10
Loss by calcination	4.05
Total	100.00

Calcium Chloride.

	Per cent. by difference.
Calcium chloride	70.27
Magnesium chloride	0.18
Silica and oxide of iron	0.11
Sulphate of lime	trace
Water	29.44
Total	100.00

	Calculated analysis of the charge	After melting 7.20	After adding $CaCl_2$ 8.35	10.10	11.30	Steel
	%	%	%	%	%	%
Carbon	1.67	0.40	8.33	0.22	0.15	0.15
Silicon	0.15	trace	—	—	—	trace
Sulphur	0.37	0.36	0.093	0.082	0.058	0.047
Phosphorus	1.67	1.25	1.106	0.343	0.065	0.056
Manganese	0.46	0.22	—	—	—	

Slags.

	After adding $CaCl_2$ Per cent.	Steel slag Per cent.
Lime	54.65	48.98
Chloride of calcium	7.70	2.02
Iron	2.20	10.20
Protoxide of manganese	2.80	5.01
Silica	10.75	10.20
Phosphoric acid	10.81	12.30
Sulphur	1.25	0.65

Sulphur removed in 1¼ hours after adding chloride of calcium = 73 per cent.
Total sulphur removed = 87 per cent.

On August 9, 1892, I watched a charge of metal worked at the Wigan Works, and the following are the analyses of the products:

FURNACE D, 1121, AUGUST 9, 1892.

	From charge after melting.	One hour after adding calcium chloride.	Slag at the time of tapping.
	Per cent.	Per cent.	Per cent.
Lime	42.42	44.34	47.86
Calcium chloride	trace.	6.65	1.66
Magnesia	5.11	4.61	4.03
Protoxide of manganese	7.18	3.20	3.37
Peroxide of iron	2.43	2.28	4.57
Protoxide of iron	4.63	3.34	10.41
Alumina	2.24	1.65	1.78
Silica	19.45	14.45	11.75
Sulphur	0.28	0.53	0.57
Phosphoric acid	15.34	18.60	13.73
Not determined	1.02	0.81	0.55
Total	100.14	100.26	100.28
Less oxygen of lime combined with S	0.14	0.26	0.28
Total	100.00	100.00	100.00
Metals.			
Carbon	0.83	0.34	0.120
Manganese			0.650
Silicon	trace.	nil.	nil.
Sulphur	0.17	0.082	0.055
Phosphorus	1.07	0.65	0.048

Sulphur removed one hour after adding chloride of calcium = 52 per cent.
Total amount of sulphur removed = 67 per cent.

The lime is evidently deficient in this charge, which may account for the less perfect elimination of sulphur.

REMOVAL OF SULPHUR FROM FLUID CAST IRON.

This process is similar to that of Heaton and Warner, but instead of using alkaline salts a mixture of lime and chloride of calcium is employed. With Mr. Saniter's consent I saw a charge of iron treated on August 9, and I analyzed the metal before and after passing through the purifying process. As the metal at the furnaces at the time of my visit was of a rich character and almost free from sulphur, I was informed that it was not suitable for desulphurizing; but as I pointed out that in all purification processes it is the last traces which are most difficult to remove, and that if sulphur was removed in any amount whatever from iron containing less than 0.05 per cent. sulphur, we should have confidence in believing that a greater proportion would be removed from more sulphurous material, and it was therefore arranged to make a trial with the iron just as it was. For this purpose about 70 pounds of crude chloride of calcium was obtained, containing as follows:

Description.	Dried. Per cent.	As received crude. Per cent.
Calcium chloride	97.60	70.27
Magnesium chloride	0.25	0.18
Insoluble residue	0.15	0.11
Sulphate of lime	trace	trace
Water	2.00	29.44
Total	100.00	100.00

This was mixed in a powdered state with 60 pounds of crushed lime, and the mixture was placed on the bottom of an ordinary ladle lined with fire bricks. The ladle was heated before the mixture was added. Some pieces of wood were thrown on the surface of the mixture to prevent the stream of metal which was afterward poured into the ladle from passing under and through it. This I was informed was not usually done. When the blast furnace was tapped the first portion of metal run was directed into the ladle, which it nearly filled (2½ tons). As soon as the metal passed into the ladle, flames and fumes were copiously given off. The flames were due, to a certain extent, no doubt, to the effect of the heat on the wood; but the water added in the chloride of calcium must have been decomposed and the hydrogen liberated, which of course burned at the top of metal. Fumes of hydrochloric acid were also detected. The action seemed to be very energetic, but only lasted for about three minutes. The slag on the surface and the metal below were both quite fluid, and the latter, as soon as the reaction had ended, was poured into molds on the pig bed. No skull was left in the ladle, and apparently the "mixture" had very little chilling effect on the metal. The metal before and after treatment was sampled, and analyses made in my laboratory, with the following result:

	Metal before treatment.	Metal after treatment.
Sulphur	0.036	0.012

Manganese, above 2 per cent., 66 per cent. sulphur removed.

It is unfortunate that the sulphur was not higher and the manganese less, as it is impossible to say in this experiment whether the desulphurization was effected by the manganese or the "mixture." Mr. Saniter informs me, however, and I have no reason to think differently, that on an average above 80 per cent. of the sulphur is removed, even when manganese is absent. There can be no doubt about the very wonderful desulphurizing effect of oxychloride of calcium.

The Cost of Iron Ore Carriage.

The cost of iron ore carriage on the Great Lakes in modern steel propellers (interest and depreciation on plant not included) is less than one-half mill per ton-mile, according to figures recently given in the *Marine Review*, for the Minnesota Steamship Company's steamer "Manola." During the season of 1890 this ship was in commission 222 days, of which 175 days were passed in actual sailing, and 47 days in port. She made 30 round trips, and carried 71,171 tons of iron ore, or an average of 2372 tons per trip. The average time spent in loading was 7½ hours; in unloading, 12 hours. The average time required for a round trip was 7 days 9½ hours, the average mileage being 1686 miles per trip.

The average speed of the ship was 12.72 miles per hour light, and 11.85 loaded, and to attain this she burned an average of 209 pounds of coal per mile light and 226 pounds when loaded. She carried a crew of 23 men. The total distance traveled during the season was 50,584 miles, and the total ton-mileage of freight carried was 3,600,079. It must be remembered that cargo is carried only one way, the up trip to Lake Superior being made light.

The total earnings of the ship for the season were $93,738; the expenses were $55,114, or 58.8 per cent. of the earnings, and the net earnings were $38,624. She thus earned an average of $422 gross and $174 net per day while in commission.

The following averages are derived from these figures:

	Per mile traveled. Cents.	Per ton carried. Cents.	Per ton-mile Cents.
Earnings	185.3	131.7	0.078
Expenses	109.0	77.4	0.046
Net earnings	76.3	54.3	0.032

The principal items in the expense account were:

	Amount.	Per cent. of total.
Handling cargoes	$16,112	29.2
Fuel	14,427	26.2
Labor	10,021	18.2
Provisions and supplies	3,365	6.0
Insurance	5,471	9.9
Miscellaneous	5,778	10.5
Total	$55,114	100.0

Japan is fast adding to the variety of her manufactures in demand for domestic purposes.

Power Transmission in High Buildings.

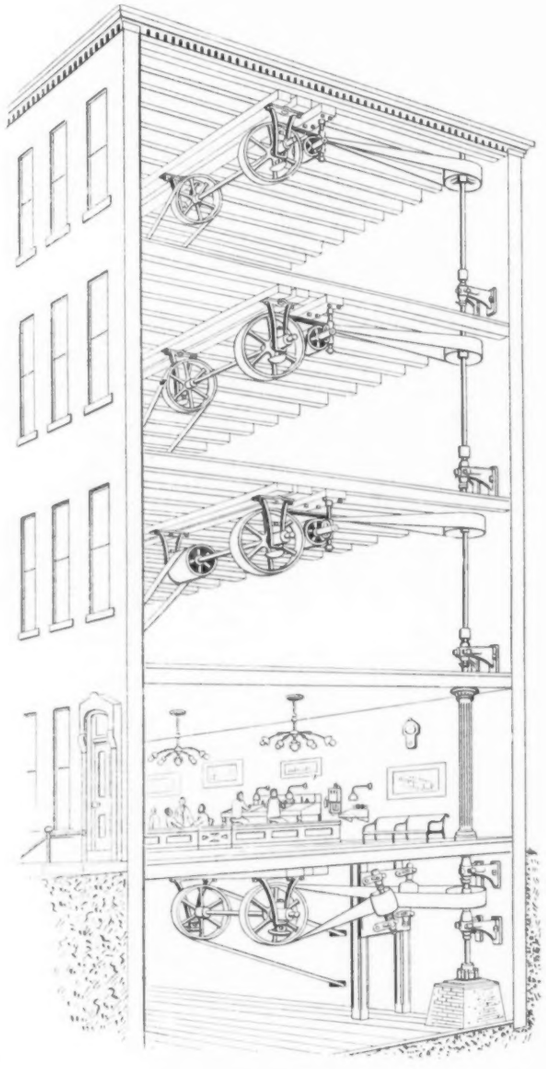
Modern manufacturing buildings, unlike those of earlier date, are built as high as the nature of the business will admit—at least, in large cities and localities where the value of real estate renders it desirable to utilize the ground occupied to the fullest possible extent. The cost of construction of the additional floor space is, proportionately, much less, and in many other respects there is considerable gain in economy. During the past decade a very profitable investment for capital has been found in the erection of large buildings for general manufacturing purposes, in which tenants are enabled to obtain floor space suitable to their requirements, whether it be one or more stories or a small subdivision of one. As these are usually model buildings, and contain all the latest improvements in facilities, such as ventilation, artificial and natural light, elevator service and reliable steam power, they present a great contrast to the crowded, dark and ill ventilated rookeries—the very exaggeration of unhealthiness and inconvenience—which they are designed to replace. The cost of rentals in these new buildings being little, if any, in excess of that in the old style, has rendered the former very popular among small manufacturers, and even those of greater magnitude frequently find it desirable to avail themselves of their superior facilities, in preference to occupying a building exclusively their own.

As such structures are usually from four to eight, or even ten stories high, the question of adequate power transmission becomes a matter of the first importance. Each floor has one or more lines of shafting, and the usual method of driving is by leather belting from engine or jack shaft to line on first floor, and from this, successively, to the floors above, until the top is reached. The objections to this system are both numerous and serious. The drive being, necessarily, either vertical or slightly inclined, is subject to unavoidable slippage, unless provided with some tightening device, which, at best, can only be regarded as a makeshift, and a source of continual trouble and expense. As any stoppage or irregularity of the transmission affects each and every line of shafting beyond the point where it occurs, and as it is more likely to occur at the lower floor, where the duty is the hardest, the entire building above the first floor is subjected to the annoying and expensive variations of speed, or entire stoppage, as the case may be.

In recognition of this defect numerous attempts to improve the method of driving from floor to floor successively have been made. Rope transmission systems, employing automatic tension devices, have been very successfully used to overcome the tendency to slip. Vertical shafts have been tried, which, driven directly from the prime mover, have enabled the use of an independent drive for each floor, irrespective of those either above or below it. This feature, being a pre-requisite of reliability in transmission, would appear to recommend the use of such a device as a most admirable means of overcoming the difficulties of other methods. Unfortunately, however, that mechanical bugbear, the "step bearing," was necessary to enable the use of the vertical shaft. The pressure on the step, due to the weight of a long shaft, as required for furnishing any considerable amount of power, was found to be so great that it could not bear the continuous motion required of it without heating to such an extent as to become a source of trouble, even greater than that of the old system of belting. The many advantages possible from its successful use, however, afforded sufficient inducement to continued effort for some means of overcoming the single obstacle to its use, and with the usual result of a satisfactory solution of the problem.

The accompanying illustration of a building equipped with this system of transmission, as applied by the Geo. V. Cresson Company, Philadelphia, shows very clearly the general features of the drive, although the step bearing is not given in detail. But little description is necessary, as the essential features of the system are in the step, and the methods of belting from the vertical main shaft to the several horizontal lines on the different floors. By reason of the peculiar construction of the step, a perfectly true bearing between the revolving and stationary faces is maintained, irrespective of the alignment of shaft and foundation—consequently any settling of the latter can have no injurious effect on the running of shaft. The entire bearing being filled with oil, and the faces so constructed as to insure its free access thereto, the important feature of perfect lubrication is made automatically certain. Being entirely inclosed, the access of dust or any abrasive substance is rendered impossible, and the only attention required is to renew the supply of oil as often as may be necessary.

Of course a step bearing "running in oil" is nothing new, as, from the vertical position of the parts, it is a plan that would most readily suggest itself. But the presence of an unlimited quantity of lubricant surrounding the bearing surfaces does not insure lubrication. On the contrary, it was this very fact which for so long stood in the way of using the vertical shaft, not only for transmission, but for other purposes, for which, in other respects, it was peculiarly adapted. The reason for the difficulty is plain enough, being simply that the pressure on the step was so great as to prevent the entrance of the oil surrounding it, even had not the centrifugal force, due to the speed of shaft, tended to throw the oil away from, instead of towards the center. Many different methods for overcoming this difficulty have been devised, and after thorough test been relegated to the class of failures. Of course all were not of this character, as some very admirable bearings have been made and used with perfect success. But as a device suitable for one application is not necessarily so for others, it seems that the first really successful adaptation of the step to the peculiarly trying conditions of power transmission is that of the Cresson Company.

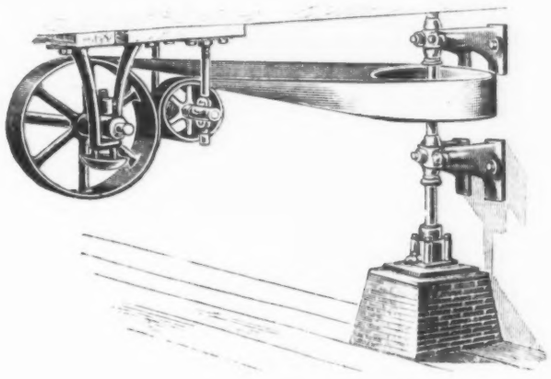


THE CRESSON POWER TRANSMISSION.

At the time of the destruction by fire of the Jayne Building in Philadelphia, in 1871, the progress of the flames from floor to floor was so rapid as to give the operatives barely time to escape with their lives. At an investigation by the management, after the fire, it developed that the system of driving the several lines of shafting,

was by belting through the floors; and that the high speed of the belts and the accumulation of combustible matter with which they are always more or less charged, carried the flames through the belt holes from floor to floor before there was time to stop the engine, and the entire building, from basement to roof, was ablaze at the one time. During the erection of the present building, it was decided to adopt some plan for transmission by which a repetition of the disaster from the same cause would be rendered impossible. The idea of using the vertical shaft was suggested by Mr. Cresson, and after being very thoroughly considered, was finally adopted—notwithstanding that it was greatly ridiculed and failure predicted by some of the leading engineers. The sequel, however, has proved the contrary, as the shaft has been in continuous operation for over 20 years, and during that time, Mr. Cresson states, has not cost a $5 bill for repairs.

As the shaft runs at a speed of 200 revolutions per minute, with a pressure on the step bearing of 275 pounds per square inch, this would seem to be a most satisfactory indication that the scheme was not a very bad failure. The success of this initial application of the device has led to its adoption by a large number of leading manufacturing and other buildings —over fifty in the cities of New York and Philadelphia being noted. The *Judge* Building, New York, is thus equipped, and though the shaft runs at 200 revolutions per minute, with a pressure of over 450 pounds per square inch on the step bearing, it is giving perfect satisfaction. As the heavy pressure and high speed of this shaft render it a crucial test of the reliability and efficiency of such a device, there does not seem to be any reasonable doubt as to its applicability to almost any purpose of transmission, no matter how high the building nor how great the amount of power to be distributed by it.



THE CRESSON POWER TRANSMISSION.

Originally, the idea was to use the ordinary quarter-turn method of belting, but as this was considered, in many respects, objectionable, a system of guide pulleys or idlers was devised by which the belt was subjected to much less strain, and was guided truly in line with both driving and driven pulleys, whether the motion of engine was ahead or backward. This, of course, is impossible with a plain quarter-twist, as the idle or slack side of the belt must line with the driven pulley in the center of its plane of rotation, while the working or pulling side will be out of line with it the distance of the entire diameter of driver from crown of driven pulley. At the same time the position of the crown of driver with relation to the driven will subject that side of the belt to the same distortion. It is obvious, therefore, that by the time the pulley had made but half a revolution in the wrong direction the belt would have run entirely off its face. The use the idlers render the drive is almost as simple as that by a straight belt. Ordinarily, the single pulley is used. This is shown in detached section, and needs no explanation.

In exceptional cases, where the relative locations of driving and driven pulleys will not admit of its use, the double idler, as shown in the drawing, belting from the jack shaft to the vertical shaft, is used. While the latter is entirely applicable to all drives, it is unnecessarily expensive, and no better, where the single pulley will answer. The journal bearings of the shaft are of the ordinary wall-bracket form, and provided with all the most approved devices for alignment and lubrication. It will be noticed, as a matter sometimes convenient, that where it is desired to carry the shaft through an office or portion of the building in which no power is required, it may be entirely hidden from observation by inclosing it within an ornamental cast-iron column. Of course, the shaft is perfectly noiseless, and its presence in the room, when thus concealed, could not be detected.

The power supplied to each floor is entirely independent of all the rest; and so long as the vertical shaft is running, it matters not what contingencies may arise in other portions of the building. With cut-off couplings, or friction clutches in the main driven pulley, the line may be placed under perfect and independent control for both stopping and starting, and the vertical shaft becomes, for its entire length, merely an extension of the engine or prime mover.

Not the least of the advantages of the system is the absence of belt or other openings through the floors. These are not only a source of danger from fire, but are extremely unsafe, unless boxed in to a hight of at least 6 feet, and in any case are an unmitigated nuisance. As to the fire risk, any device by which the danger is decreased is promptly recognized by the underwriters, and the rates made correspondingly less. There is also a saving in floor space, which at the point of passage of the belt is usually valuable, even when other portions of the floor are not crowded. It will be noticed that the shaft bearings are located, one for each story, near the floor, and are therefore conveniently accessible for inspection, lubrication, &c., while the entire length above the coupling, located next to the box, is clear and available for the necessary pulleys, if more than one.

The location of shaft may, of course, be made to suit the convenience of the general plan of shafting throughout the building, as, in case of very large floors, it may be found desirable or necessary to have two or more parallel independent lines, and also to drive others at right—or, in fact, any—angle, with reference to the main lines, without the necessity for meeting the very unsatisfactory problem of how to do so without the use of bevel gearing, or some other equally abominable contrivance. This would require the location of the vertical shaft at some central point, from which the belting might go off in any direction as numerous as the rays of a star. Of course, a separate driving pulley would be necessary for each drive, but as more than three-fourths of the length of shaft is available for the purpose, and the idler guides taking care of the belts, there is no difficulty to be experienced from this fact. It might be urged as an objection to the use of idlers that they occasion the loss of a considerable percentage of power. To meet such objections, a carefully accurate test was made, in comparison with the plain quarter-twist belt—the result showing the loss from friction of idlers to be considerably less than that from the power consumed in the severe straining of the belt necessary to the quarter-twist. The Cresson Company unhesitatingly recommend the system of vertical-shaft transmission as by far the best within their knowledge, and this, notwithstanding the fact that their line of business is the transmission of power exclusively, and that all modern (or antiquated, if ordered) systems and devices can be furnished by them with equal facility—their preference for the former being entirely based on their estimate of its superior merits. With so favorable a record to confirm their opinion, it appears to be well founded.

Troops Removed From Homestead.

On Thursday of last week soldiers belonging to the National Guard of Pennsylvania who have been on duty at Homestead for more than three months past were discharged from service, and affairs at that place are now in complete charge of deputy sheriffs under control of Sheriff McCleary of Pittsburgh. The soldiers were on duty at Homestead 95 days, which is the longest time that the National Guard of Pennsylvania has ever been in service since its organization. During the railroad riots at Pittsburgh in 1877 troops were on guard at different places for about 75 days, which is next to the longest service on record. Since the troops were stationed at Homestead, warrants representing the sum of $351,832.35 for the pay of troops, transportation, quartermasters' expenses, &c., have been drawn. This amount does not include a bill of the Pennsylvania Railroad Company amounting to about $52,600 for transportation. It is stated that the placing of troops at Homestead will cost the State of Pennsylvania about $600,000 after all expenses have been paid.

Col. O. J. Hodge, who lectured in Cleveland last week, described a recent visit to the Sandwich Islands. The entire population of the islands was stated to be 85,000, of whom 35,000 are natives, 15,000 Chinese, and 20,000 Japanese. "The Americans, though few in number, wield the greatest influence," said Colonel Hodge. "The United States and the Sandwich Islands are closely connected commercially; the native population is fast dying out, and it will not be many years before the Stars and Stripes will float over the islands and a new star be added to our constellation of States." Honolulu was described as a cosmopolitan city of 18,000 inhabitants, with fine residences, good stores, electricity, and other modern luxuries.

THE INDIANA GAS REGION.

The natural gas region of Indiana has now been in course of development for some six years. During that time it has passed through three stages or periods of varying growth in industrial expansion. The first of these was the rapid migration into the district of industries from localities which were not favored with gas. The second period was an interval of waiting to see whether the supply of gas was reasonably permanent, so as to justify the cost of removing further extensive plants from points at which they had built up a large trade. Many manufacturers who were anxious to avail themselves of the cheap and very desirable vapor fuel were influenced by reports from geologists and others that natural gas could only be expected to last a short time after a field was tapped. As years passed by, and the fuel question appeared to have no terrors for the Indiana manufacturers who were depending on natural gas, another period of industrial growth set in, even more strongly than the first, and the end of this movement appears to be still far off. The past two years have witnessed wonderful growth in many of the Indiana towns which were of some prominence as manufacturing points four years since. They are still growing rapidly, and of late a number of new towns have been forcing recognition for themselves.

A few points in connection with the Indiana gas region, which are of general interest, may be stated here. First, the great extent of this gas-bearing field is a very strong point in the estimation of those who are now locating factories in it. The district covers about 2600 square miles, and is thus far the largest natural gas field known. In one of the counties located in the district a well-known manufacturer offers to give his bond for a reasonable amount that natural gas will be found by driving a well at any point which may be selected in that county. The great extent of the field thus offers further opportunities for sinking fresh wells in case any of the old ones are exhausted. The districts in western Pennsylvania and in Ohio, in which the supply of natural gas has given out, were of small extent and were pretty thoroughly covered with wells. Second, the Indiana manufacturers have profited by experience and do not use natural gas with the recklessness which characterized the early consumers. They recognize the fact that the supply can be exhausted just as a coal bed can be worked out, but claim that with proper care the store of gaseous fuel can be so husbanded as to last for many years. The flambeaux which were once so conspicuous in natural-gas towns are now very rarely seen. Fires under boilers are not kept burning when not needed, but the flow of gas is carefully turned off, just as it would be if there was a meter on the property merrily ticking away and registering a big gas bill. The pressure gauge of a well is closely watched, and if the well gives signs of being overdrawn it is closed for recuperation, and another well is put in service. An illustration of this is seen at Anderson, where a syndicate of manufacturers own five wells, some of which are always laid off while the others are in use, with the result that for years none of them has shown even a diminution of a pound in pressure. At Muncie the Muncie Nail Company have three wells, which have been carefully tested for the past two years while being operated as above described. One of these wells shows the original rock pressure, another shows an increase of 5 pounds, and the third an increase of 15 pounds, despite the continuous draft upon their resources. This intelligent care of gas wells and the great extent of gas-bearing territory yet undeveloped, seem to give the Indiana gas field a reliable basis upon which manufacturers can depend for many years to come.

Passing to a consideration of the iron and steel interests of the region, it should be noted that the trip through it which forms the subject of this article was taken rather hurriedly. The writer has no doubt that there are several interesting establishments in which iron and steel are worked into finished products which were not visited. Some of these are off the line of general travel, and had to be neglected in the pressure for time, while others in the larger towns were so remote from the business center as to be equally difficult to reach. Our purpose, however, is to show the importance at present of the manufacturing industries in the Indiana gas region, and certainly sufficient data have been gathered to make this clear.

The American Wire Nail Company.

at Anderson, were found to be in flourishing condition, with every department running full. The output of the nail factory is at present 1200 kegs of nails per day, but an addition of 100 by 90 feet is now being built, in which a sufficient number of machines will be installed to increase the product to 2000 kegs. The company also manufacture market wire, and have quite recently built a galvanizing plant. They turn out an exceedingly fine quality of galvanized wire. This plant has some new features, conspicuous among which is an annealing furnace built upon a design original with these works. In the process of galvanizing, 16 wires are annealed, pickled and coated at one time. The capacity of the company's wire rod mill has hitherto been somewhat greater than their finishing departments could handle, but the improvements now being made in the latter are expected in the course of a short time to absorb the surplus.

The Anderson Bolt Works

of Fowler & Sons, Anderson, are in full operation and enjoying a healthy demand. These works are owned by Fowler & Sons of Buffalo, N. Y., and have been managed by a superintendent. Recently a member of the firm removed to Anderson and entered upon the duties of the management. Additions to the capacity of this plant are among the possibilities of the near future.

The Hazen Company

of Anderson have built up a wide reputation as manufacturers of high-grade small nails, usually put up in papers or in 25-pound boxes. They continue to make a specialty of small nails, but have latterly increased their plant for manufacturing standard nails. Their output is now over 500 kegs a day, ranging from the most diminutive nail to the largest spike. The company are purchasers of wire, but contemplate the erection of a wire-drawing mill next spring, which will be located in a separate building immediately adjoining the nail factory.

The Anderson Bolt and Iron Company

of Anderson are doing a prosperous business. The past year they have made improvements in their packing and shipping rooms, securing greater facilities for the prompt shipment of goods. They have enjoyed a very heavy demand for some time, which taxes the capacity of their plant.

The Arcade File Works

of Anderson, removed from Sing Sing, N. Y., where they were established in 1842, have been in operation at their new location for about two months. The interruption to their business caused by the stoppage and packing of machinery, its removal 900 miles and its installation at Anderson, only covered a period of two and a half months, but in that time their accumulated stock of files was so heavily reduced that they have since been unable to catch up with their orders. The new plant consists of three very substantial and well-arranged brick buildings. The largest of these occupies a ground space of 300 x 40 feet, and is partly two and partly three stories in hight. It is devoted to cutting, hardening and packing files, a machine shop and warerooms for carrying stock. The windows in this building are all made of cathedral glass, thus admitting an abundance of light but no sun, while the floors of the work rooms are solidly made of 2 x 4 inch plank laid on end. Another building, also 300 x 400 feet, but one story in hight, is used as a steel stock room, forge, annealing room and grinding room. The forge contains a number of cushioned helve hammers as well as drop hammers. All the dies used in the forge are made on the premises. The third building, 90 x 40 feet, is used as a boiler and engine room, containing two flue boilers and a Reynolds-Corliss engine built by the E. P. Allis Company of Milwaukee. The shops are so arranged that the steel goes forward steadily through the various processes to the shipping room. Special care has been taken to secure good light and ventilation throughout the entire works in order to provide the working force with as pleasant surroundings as possible. All kinds of files are made within the range of 2 to 24 inches. The greater part of the product is machine cut, but some hand cutting is also done. From 900 to 1000 dozen files are now made daily, but large additions to the plant are to be made in the near future, when the capacity will be extended to 1500 or 2000 dozen. The company now purchase their paper boxes for packing, but expect shortly to manufacture them. Shipping facilities are excellent, a spur track running into the company's yard. The plant is finely located on high ground, with ample room for enlargement. Natural gas is exclusively used for light and heat, the company belonging to a syndicate owning five wells, of which two are used and three are always held in reserve. The files are branded with a horseshoe, but the trademark is Arcade. Samuel W. Allerton of Chicago is president of the corporation; Cortlandt C. Clark is vice-president and treasurer, and Andrew Finegan is superintendent of the works. Warehouses are maintained at 83 Reade street, New York, and 23 Lake street, Chicago.

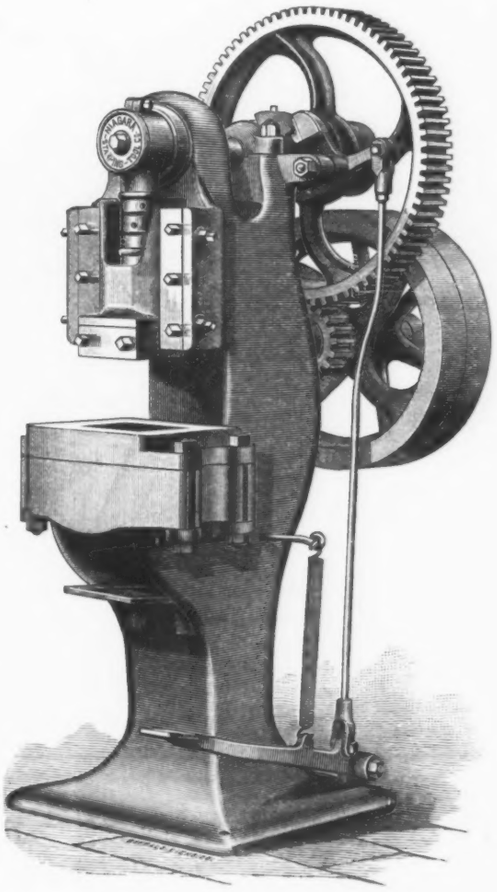
The Anderson Tin Plate Works,

at Anderson, although of limited capacity, have been established for a sufficient length of time to turn out a considerable quantity of terne and bright plates which have been well received by the trade. The aim of the managers is to produce plates of the best quality only. They have two pots—one Morewood for terne plate and one Edwards for bright plate. The black plates are purchased, the works as yet having no rolling mill. Samuel W. Allerton and Cortlandt C. Clark of Chicago are now financially interested in this establishment, and it is expected that operations will be pushed more vigorously than the founders of the plant were able to do on their limited capital.

The Haugh-Kurtz Steel Company

of Anderson have recently completed a plant for the manufacture of steel castings. The main building of these works is 175 x 75 feet, having an iron frame and corrugated iron roof and sides, so that it is completely fire proof. A 12 ton Siemens open-hearth steel furnace and a furnace for heating spiegel, &c., are located at one end of this building, on an elevated

platform, sufficiently high to afford ample room under it for the storage of bricks, sand and other materials. Three hydraulic swing cranes serve the casting floor. Along the sides of the building are arranged a machine shop, a sand grinding room and annealing furnaces. At present but one annealing furnace is in operation, with a second in course of construction. The erection of the second annealing furnace has been compelled by the rapid growth of the company's business. A second building, also covered with corrugated roofing and siding, is used as a pattern shop and forge. The company have had excellent success in the manufacture of castings, having already established a trade extending to the Pacific Coast. They make castings from 12 pounds up, paying special attention to heavy work.



POWER PUNCHING PRESS.

Some very large crank shafts have been turned out within the past month, some of which have weighed 5000 pounds. Their machine shop is well equipped for finishing large castings. The success attending the operations of the works is shown by the fact that for some time past they have been crowded with orders to their full capacity. Excellent shipping facilities are enjoyed. A spur track runs into the molding floor, enabling castings to be loaded thence directly on cars for their destination. They have their own gas well, which is used for no other purpose than operating the works. The property of the company is amply sufficient for an enlargement of the works to several times the present plant. The main office of the company is at Indianapolis.

The Irondale Steel and Iron Company

of Anderson have had their sheet mills in operation for some two years. Their product is principally sheet iron of light gauges, but some sheet steel is also made. The plant is running to its full capacity with its entire product under contract for the remainder of this year.

The Wright Shovel Company

of Anderson were originally located at Beaver Falls, Pa., and have now been running at Anderson for about eight months. Their entire operations, except the manufacture of handles, are concentrated under one roof, the size of the building being 332 x 50 feet. The product comprises all kinds of open-back shovels. The company manufacture their own sheet steel, purchasing slabs and rolling them into sheets in a three-high, 16-inch train of rolls, 32 inches wide, finishing the sheets in widths of 16 to 24 inches. The rolls are in one end of the building, the machinery being so arranged that the steel passes forward continuously until the completed shovels find their way to the packing and shipping room at the other end of the building, in which the office is also located. The pickling, acid and grinding rooms are in small annexes along the side of the main room, at convenient locations. The machines used are in numerous instances of designs original with this company. Two large presses, for instance, have been built for pressing scoop shovels into shape. The pressure is applied by a screw operated by power. A die of the exact shape of the scoop rests on the bed plate of the machine, into which the flat steel sheets, heated to a cherry red, are so evenly pressed that the metal forms the bowl of the shovel without corrugating or overlapping. Another interesting machine is used for forcing handles into sockets. The handle is gripped tightly in a horizontal position, and the shovel is forced forward by a cam on a heavy shaft. Great care is taken at every stage to test the work so as to insure perfection in all points possible. Only high carbon steel is used, and every shovel is warranted to be made of this class of material. The company also manufacture their own handles, which is done in an adjoining building. One of the causes prompting them to remove to Indiana was that they might get closer to a supply of the necessary timber for handles. They are now turning out about 100 dozen finished shovels daily. Thomas W. Wright is president of the company and W. J. Alford secretary and treasurer.

The Anderson Forging Company

of Anderson, whose works were burned a few months since, have just completed a new plant and are now getting the machinery in place. They have a fine building 200 x 50 feet, which is equipped with drop forges and all the necessary machinery to turn out carriage hardware, which is the exclusive product of the establishment. It is also the aim of the company to make specialties rather than a general line. When in complete running order they will employ about 50 men.

(To be continued.)

Power Punching Press.

The Niagara Stamping & Tool Company of Buffalo, N. Y., have recently introduced a line of power punching presses, as shown in the accompanying engraving. These presses are made in five different sizes and are adapted for doing a large variety of work, including punching and cutting from heavy sheet metal, trimming drop forgings, &c. Power can be applied direct to the crank shaft by belting to the fly wheel, or the machine back geared (cut gearing being used) and fitted with tight and loose pulley, according to the work that they are intended for.

One of the new features is the means of taking up the wear in the main bearing. This is accomplished by means of a taper split bronze sleeve or bushing, with collar on the rear end, through which screws pass into the main casting, with a nut on each side of the collar. The bearing is easily and quickly adjusted by these nuts, and a solid bronze bearing assured to receive the thrust of the pitman instead of the usual cast iron or babbett metal as heretofore used. The rear bearing is provided with a cap and screws for taking up the wear.

The slide has been made with extra wide wearing surfaces, and the guides made longer than usual, leaving the slide in the guides its whole length while the punch is doing its heaviest work, thus making the press especially suitable for cutting and punching. The guides have a lateral adjustment upon each side of the slide to allow for wear. The adjustment of the slide is made by using a right and left hand screw connection with upper and lower jam nuts, as in most of the standard presses made by this company.

The upper connection to the pitman has an exceptionally long thread, so that when the slide is at its lowest adjustment there is still sufficient thread to withstand the required pressure. The punches are fitted to the slide by means of a round shank, with a set screw in front or with a cap, as shown in the cut. The bed of the press and size of the hole in the same are made according to the work that the press is intended for or best suited for the purchaser's requirements. Underneath the bed is a removable shelf on which to place a box to receive the punchings. These presses are all fitted with the Niagara standard clutch, which allows one stroke only at every depression of the treadle, or by fastening down the treadle the machine will run continuously.

The Green Engine Governor.

The governor of which drawings are here presented is the invention of M. A. Green, president of the Altoona Mfg. Company of Altoona, Pa. Practical tests upon engines built by the above company and provided with this governor have shown that when the load is instantly removed the governor responds quickly and regulates to within 1 per cent., showing no signs of distress whatever. From the patent specifications in accordance with which the governor is constructed we take the following description:

It has been found that to construct a centripetal governor to maintain perfect regulation it has to be in equilibrium—that is to say, the centripetal force must be in exact harmony with the centrifugal force at all points of cut-off. Unfortunately there arises a difficulty here, that if the governor is so arranged that the two forces are in exact harmony with one another at all points of the cut off the governor becomes unstable and will go from one extreme to the other—what is known as "racing." Now, to overcome this, it has been found that the centripetal force must increase more rapidly than the centrifugal force, as the balls move outward. This insures stability in the running of the governor at the sacrifice of regulation. To obviate this sacrifice of regulation this governor is designed so that the operative mechanism will automatically balance up the necessary overbalance of the centripetal force to make the governor stable.

The base plate A is attached to the band wheel, as shown in Figs. 1 and 2, and is formed with a stud B, which has its center near the center of the main shaft. The rocker or carrier plate, Figs. 5 and 6, is journaled and swings on this stud. The eccentric pin D consists of an annular base formed near its edge with a pivot lug and a central hub portion. This pin has its pivot seated in a socket in the rocker, this pivotal connection, when the parts are in the position shown in Fig. 1, being over the center of the main shaft, the pin being held to the rocker by a bolt passing through the slot shown in Fig. 5 and which is tapped to the pin D. By reference to Fig. 1 it will be seen that the pin D, to which the eccentric rod is connected, is eccentric to the main shaft. Swinging the rocker plate across the base plate A in the direction indicated by the arrow reduces the travel of the valve, and thereby reduces the quantity of steam the engine receives. The cap E forms the washer holding the strap of the eccentric rod on the pin D. The rocker plate is provided with a counterpoise Cx, the purpose of which is to balance up the end of the rocker so that there shall be no interference with the proper movement of the governor.

The weights G are secured to the swinging arms H, pivoted to the spokes of the wheel. Movable on the arms H are clamps I, to which are connected the inner ends of the double-wound springs J, whose outer ends are connected to screw nuts K, in which are fitted the adjusting screw rods L, the ends of which are connected with the clevises M, which in turn are connected to rack bars N, fitted to the rim of the band wheel, as clearly shown in Fig. 1.

By connecting the springs to the arms in the manner stated means are provided for changing the angularity of the springs J. This is a desired improvement, for the reason that no two springs can be tempered exactly alike to increase in force as they are drawn out, and for that reason the centripetal force cannot be nearly enough balanced without an adjustment to change the angularity of the spring. By means of the racks N it is possible to change the angularity of the spring to just suit the temper of each spring, so that the governor can be perfectly adjusted.

Each of the balls G is formed with a projecting ear, to which are pivotally connected arms O, the inner ends of which are connected to oppositely extending wing members formed on the rocker plate. It will be noticed by reference to Fig. 1 that when the governor balls are in their inner position the arms O almost come to a straight line, which swings the rocker plate to the position shown, such movement being limited by a stop P, with which a lug on the plate C engages, a similar stop P′ being provided, with which the lug engages when the rocker plate is swung to its limit in the opposite direction. The stops P P′ can be chipped, so as to give the desired travel of cut-off valve.

By connecting the governor balls to the rocker plate, as stated, provision is made for maintaining perfect regulation and at the same time have a stable working governor, such result being accounted for as follows: When the governor is in its inner position and when the engine is heavily loaded, the arms O become almost parallel. Now when the balls move out at the beginning of such movement the rocker plate C will be moved slightly; but as the balls reach their outer position and the angle of the arms H and O becomes sharper, travel of the rocker plate is increased with relation to the movement of the balls. By this method it requires more movement of the balls when they are in their inner position to change the travel of the valve than it does when they are in their outer position, which balances up the undue increase of centripetal force rendered by the springs. It will also be noticed that as the fulcrum for the rocker plate is near the center of the main shaft it makes the arc of the rocker very sharp, which adds to the cutting down of the valve motion, and as the eccentric pin D is pivoted on such rocker at a point over the center of the main shaft it can be readily adjusted to increase or diminish the lead of the valve, the same as moving an ordinary eccentric around the shaft.

To an extension of the rocker plate is connected the inner end of a rod Q, the outer end of which has a leather piston R, which works in a cylinder S, which serves to cushion the inward and outward movement of the rocker C.

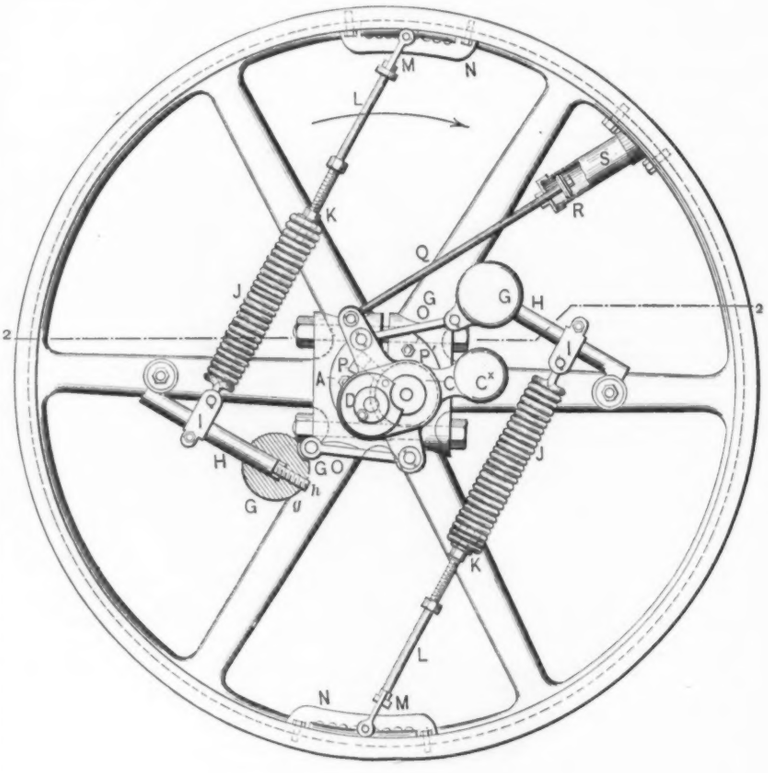


Fig. 1.—Face View.

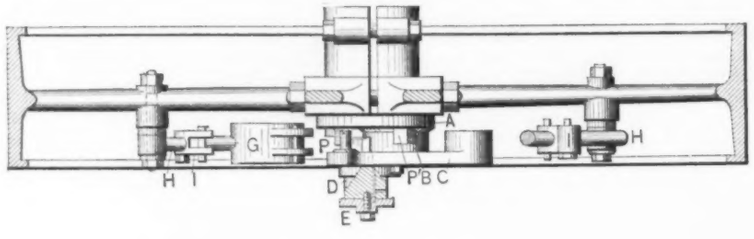


Fig. 2.—Section on Line 2 2 of Fig. 1.

THE GREEN ENGINE GOVERNOR.

The United States District Attorney in Philadelphia is probing the Sugar Trust.

WORLD'S FAIR NOTES.

Preparing for the Dedication.

As the World's Fair buildings are to be dedicated this week, the work of preparation for this interesting event has latterly absorbed the energy of everybody connected with the enterprise. As early as the 14th the decoration of store and office buildings began throughout the business district. Some of the decorations are on a most elaborate scale, and on all sides it is conceded that this week will see the grandest demonstration ever made in Chicago. The main features of the programme are as follows:

On Wednesday evening the citizens of Chicago tender a grand reception and banquet to distinguished visitors at the Auditorium Hotel. On Thursday an imposing procession of military and civic organizations will march through the business portion of the city. On Thursday evening several semi-public receptions will be given to distinguished visitors. Friday, 21st inst., will be Dedication Day proper. An elaborate programme has been prepared for ceremonies at Jackson Park, where the great Manufactures Building will be used as an assembly hall, in which a vast multitude, admitted on invitation only, will listen to music by a great orchestra and a huge chorus, orations by eloquent speakers of national fame, the recitation of a dedicatory ode, and the formal ceremonies of presenting the buildings to the World's Columbian Commission. In the evening there will be three displays of fireworks of identical design in Washington, Garfield and Lincoln parks, to gratify the residents of the three great sections of the city. On Saturday a number of State buildings will be dedicated by State authorities with impressive ceremonies.

Making Ready for the Crowd.

Four hundred carpenters began work on the speakers' stand in the Manufactures Building on the 9th. On the 12th they completed the task, having used over 1,000,000 feet of lumber in construction. The other work of preparation for the dedication in the Manufactures Building is well under way. An army of sweepers were started on the 30 acres of floor, and soon had the floor well swept and the corners all dusted. Arrangements for lighting the building have been completed. A special electrical power plant has been installed in Machinery Hall for the purpose. Above the speakers' stand and the reserved seat section will be 12 clusters of 50 lights each.

Four smaller clusters will be placed over the orchestra and chorus stand. Over the gallery will be 72 arc lights, one in the center of each arch, while under the gallery will be 90 arc lights. There will be an arc light at each of the four entrances to the building and 16 lights in the nave where the lunch will be served, making in all 242 arc lights of 2000 candlepower each.

A host of men are employed in arranging the benches and chairs. Benches 12 feet long are being placed in the galleries. They are calculated to seat 10,000 people, and there will be 1200 of them.

In the reserved section immediately in front of the speakers' stand chairs are being placed. This section will hold 15,000 people, but the total number of chairs placed in the building will be 45,000. Forty-five carloads of these chairs have been shipped from Sheboygan, Wis. Four thousand five hundred of the total number are cane seated and will be used in seating the distinguished guests, and 100 of them are upholstered and will be assigned President, Supreme Court, Cabinet officers and other notables Outside of the orchestra and chorus stands arrangements have been completed for seating 57,000 people. This will occupy one-third of the building and will leave standing room for over 100,000 people.

Flattering Report of the Fair.

Her Majesty Queen Victoria's consul stationed at Chicago has sent to the home Government a flattering report on the progress of the World's Fair. He sends, among other things, the following table of comparisons, showing how in size and cost the ground and buildings at Jackson Park exceed those of the last Paris Exhibition and the Philadelphia Centennial:

	Paris.	Centennial.	Chicago.
Area of grounds, acres.....	238	284.49	633
Area of buildings, acres.....	75.5	70.08	142 12
Cost of buildings.	£720,752	£1,037,966	£1,457,206

The approximate exhibit space at Philadelphia was 4,323,330 square feet, and at Chicago it is estimated at 9,138,888 square feet.

Consul Sadler continues by saying:

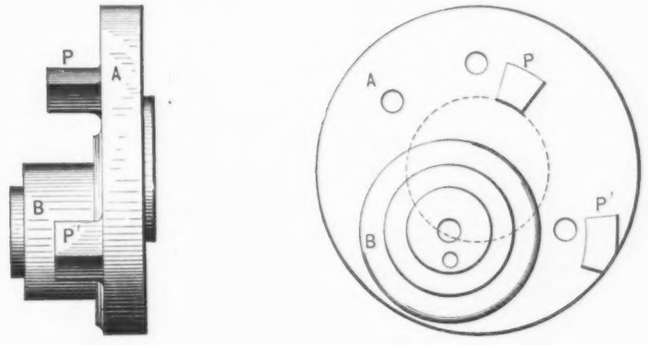
With regard to American exhibits and inventions, there will be a great deal to see. This continent has been but imperfectly represented at European exhibitions, and yet nowhere have greater advances been made in all branches of manufacture and trade, in labor-saving machinery and appliances, in science and invention.

Then after an extended review of all that has been accomplished, the consul adds this tribute to the enterprise:

As the enterprise develops the more convincing it appears that the Chicago Exposition of 1893 will be by far the most extensive and important which has yet taken place. The effect on the avenues of trade will probably be wide and far-spreading. Considerable changes and diversions may result, new connections will be made and old ones lost. Commerce does not stand still nowadays, nor is trade in these times of great competition won or retained without continued exertion, and however greatly this exhibition may benefit manufacturing and commercial enterprises in the United States, it undeniably offers the best possible opportunity of advertising by means of exhibits to the manufacturers of other countries.

Idaho's Big Log Cabin.

The Idaho Building at the World's Fair will represent a huge log cabin of two stories and basement, and 50x180 feet in ground measure. Offices and sleeping apartments for the attendants will be in the basement. Handsomely fitted up offices with convenient ante-rooms for committee work, and comfortable sleeping apartments for the attendants, will be arranged. On the first floor will be two large reception rooms. The one on the right will be the women's and will be fixed up as a miner's cabin. In addition to a thoroughly representative display of the minerals produced in the State, all the implements used in mining will be placed about the room. The panel decorations will depict familiar mining scenes, and the furniture and fixings will be of the style found in the ideal miner's cabin. Opposite will be the men's reception room, which will be arranged to represent a hunter's cabin. The decoration and furniture will follow out the idea, and trophies of the chase will adorn the walls and be placed in odd nooks and corners. The



Figs. 3 and 4.—Detail Views of Main or Fixed Base Plate.

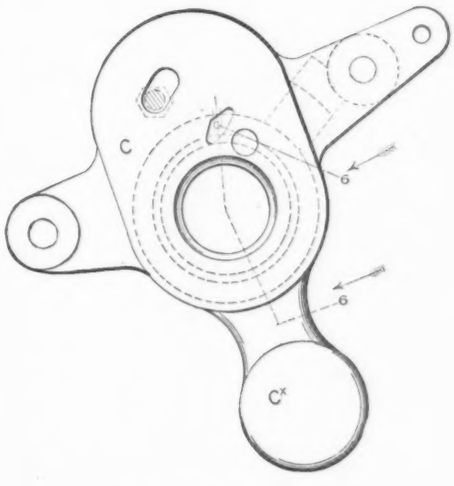


Fig. 5.—Face View of Rocker.

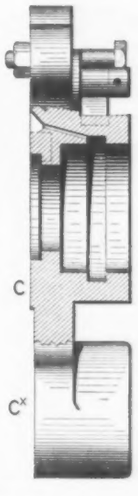


Fig. 6.—Sectional View of Rocker.

THE GREEN ENGINE GOVERNOR.

upper story of the building will be occupied by one large hall.

To Build the Japanese Temple.

More than a score of Japanese workmen in native costume are now working on the Japanese Building on the north end of the wooded island. These workmen are the cause of a good many comments, inasmuch as their presence at the park was an unusual event. It isn't customary for the Mikado to send his own people to this country to build temples. The laborers are all skilled workmen. Their dress was out of the usual. Each wore a cap with a peak fore and aft, something like that of the huntsman. They were clothed each in long blue overcoats, bound in by a girdle.

The structure will cost approximately $60,000, and surrounding it will be Japanese landscape gardening, carried out at the expense of an additional $12,000. The temple will be devoted to art and ethnological exhibits of Japan. It will be a permanent structure and at the close of the fair will become the property of the South Park Board of Commissioners. Japan was the first foreign Government to make a big appropriation for the fair. The sum set apart by the Government of the Mikado approximates $630,000.

This building is intended to represent the Hoodo or Phœnix Temple of Japan. It will consist of three separate structures connected by wide corridors, and each structure will represent a different epoch of architecture.

The left wing will be in the style of the Ashikaga period of 400 years ago; the right wing will represent the architecture of the most prosperous period of the "Fuziwara" of 800 years ago; the architecture of the main hall is of the time of the Tokugawa period, 100 years ago.

The entire building will be over 200 feet long and will follow the general ground plan of the original Hoodo, which is one of the most famous historical temples of Japan. The original Hoodo was built in the noted tea plantation district of Ugi 842 years ago.

The roofs of the buildings are to be covered with sheet copper, hammered in Japanese style. All the floors will be furnished with thick Japanese mats, except in the right wing, where tiles will be used. It is the ceilings and sliding doors connecting the rooms that will portray the highest type of Japanese art. These are to be of fine-grained wood, containing panels. The panels will be fitted out in lacquered work, and painted in the peculiar style of the Japanese.

The "Phœnix" will be largely represented in the designs, which will be wonderfully colored and worked out with gold figures.

Japanese mythology and history will be depicted in the decorations of the rooms. Artists from the Tokio Art School will be sent on to do this work. All of the furniture, as well as the art works to be displayed, will be selected by the Imperial Museum authorities. Each building will be furnished and decorated in keeping with the period which it represents.

Y. Yambe, the secretary of the Japanese Imperial Commission, has made arrangements to push the work rapidly. The details of supervision will be in the hands of M. Kuru, M.A., an architect famous in Japan, and quite well known in this country.

Rules Governing the Transportation of Exhibits.

In order that there may be a uniform understanding regarding the terms and conditions agreed upon by the railroad companies for the transportation of articles to and from the World's Columbian Exposition the following rules and regulations have been promulgated by Chairman Blanchard for the information of the roads in interest:

Bills of lading covering exhibits must show the precise routes by which such exhibits are to be transported, specifying in detail every carrier from starting points to the exposition, in order that exhibited articles entitled to free return may be returned by the exact routes first used.

All articles forwarded for exhibition at the exposition should be billed thereto, and will be charged full Chicago tariff rates to the exposition grounds, but no charge will be less than for 100 pounds at the class rate applicable thereto, nor less than 25 cents.

To the above rates there will be added a charge made by the exposition management of 6 cents per 100 pounds, with a minimum of 50 cents for any single shipment. These are the terminal charges for switching exhibits within the exposition grounds and placing them on or adjacent to the spaces allotted. This charge of 6 cents will be made in each direction and will apply with the minimun aforesaid to both carloads and less than carloads.

On all articles destined to the exposition prepayment of freight and terminal charges will be required at points of origin, and on returned exhibits prepayment will be required at Chicago of the terminal charges thereat.

Except as specified in section third and subject to the conditions hereof exhibited articles will be returned free of all charges except those of the exposition management as aforementioned over the railways comprising the Central Traffic Association only on the following terms and conditions:

Paid freight bills or original bills of lading, both of which should show the precise routes first used, and certificates signed by the proper officer of the exposition, must be presented to show that exhibited articles paid freight one way, and have not changed ownership. It must be distinctly understood that shipments of exhibits entitled to free return must be returned via same routes first used. They must be consigned to the points from which they were sent on the forward journeys. Releases must be executed, relieving the carriers from liability on the return journey in consideration of free return. No charges will be advanced on articles returned free. Persons accompanying exhibits which are returned free will be charged fare.

The standard form of rail bill of lading used by the United States Government may be accepted on shipments made by the Government to and from the exposition, and settlements of freight and advance charges made with the Government in the usual manner.

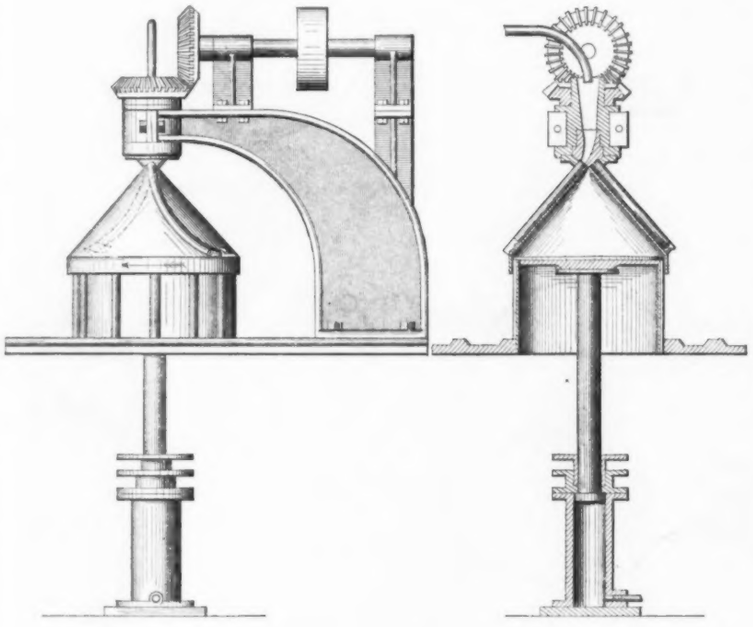
The foregoing rules have been concurred in by the Traffic Department of the exposition. The exposition management will be ready to receive exhibits November 1, 1892.

An Ice Palace.

The De La Vergne Refrigerator Company of New York want to place in the Machinery Department an exhibit of an ice palace. The building will be of Moorish design, 100 x 50 feet, with a hight of 75 feet. By means of pipes running through the walls through which brine will be circulated the moisture in the atmosphere will be congealed and the building covered with ice.

The Edenborn Rod Reel.

W. Edenborn, of the St. Louis Wire Mill Company, St. Louis, is the inventor of a rod reel which has been in operation for upward of a year in the works of the Braddock Wire Company, Rankin, Pa., and in the mill of the Iowa Barb Wire Company, of Allentown, the final result of several years' experimenting. The accompanying engravings, an elevation and a vertical section, show the design. The cylinder, lowered and raised by the hydraulic ram, has vertical grooves which receive ribs on the table, thus being prevented from turning. The upper head of cylinder is closed in order to prevent the wire from becoming tangled and entering the cylinder. Above the cylinder is a flanged cone which is attached to a hollow spindle and carries two guide tubes through which the wire passes from the feed tube above the hollow spindle. In the lower end of the latter is a bushing made of chilled cast iron, which has shown no appreciable wear in a year's running. The cone, which is well balanced, is therefore preferable to a bent pipe, and the flange depending from it, over the edge of the cylinder, inclosing it, precludes the possibility of the entry between the cone and the cylinder, of the wire rod, thus causing damage.



THE EDENBORN ROD REEL.

The depending flange provides a surface larger than the cylinder, upon which the last coils of wire are wound, these last coils being the wire contained in the tubes after the end of the wire has left the rolls, and the friction of the wire in the tubes causes it to be drawn very tight, so that when the cylinder is lowered to free it of the coiled wire these last coils, being drawn over the larger moving surface,

will drop down on to the main part of the coil, and will not be contracted upon the cylinder in cooling, as they would if drawn and wound upon it; and thus these coils do not interfere with the removal of the cylinder from the wire coil. It will be understood that as the cone revolves the last coils will not be permitted to shrink tightly on it, as they would if drawn upon the surface of the cylinder, which does not revolve.

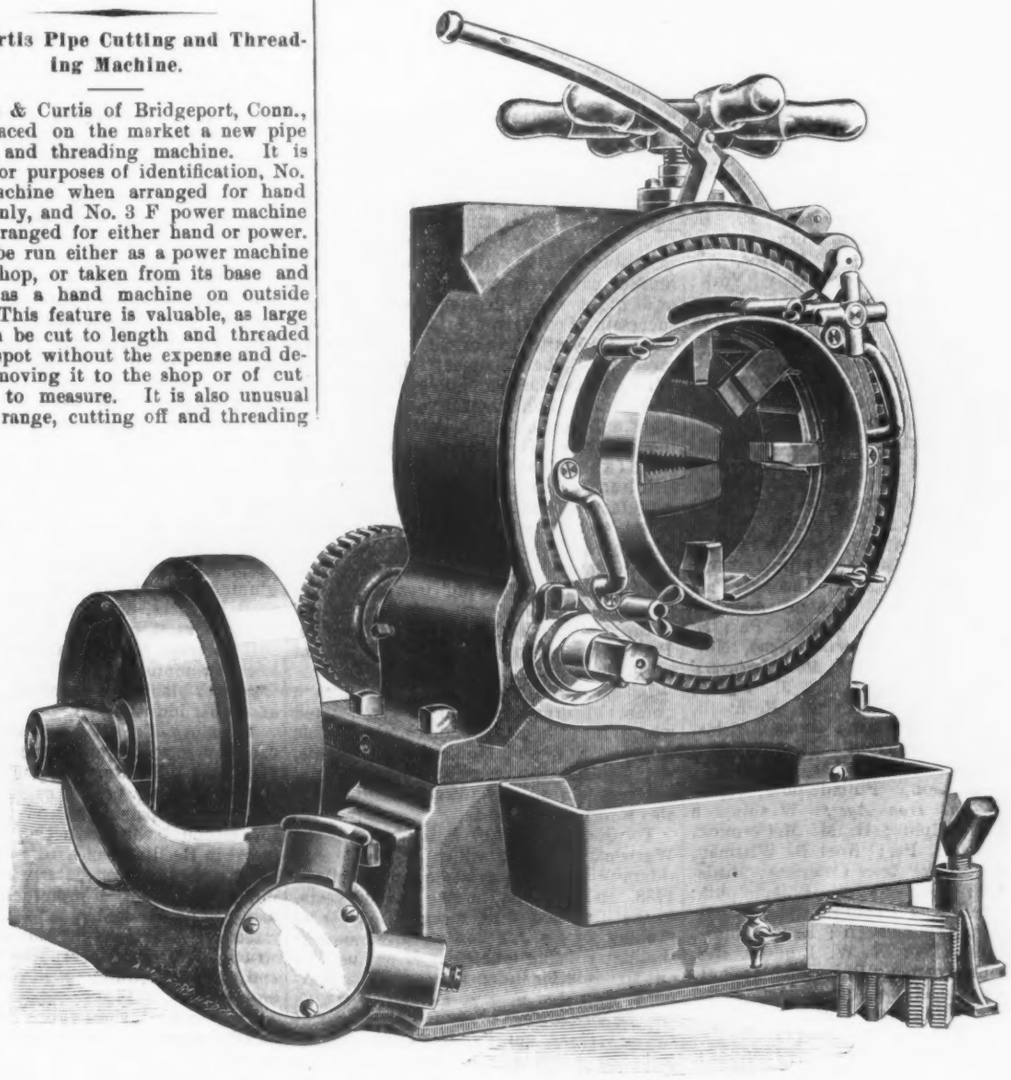
The Edenborn machine is simple, durable, requires little attention and has proved efficient in practice.

The Curtis Pipe Cutting and Threading Machine.

Curtis & Curtis of Bridgeport, Conn., have placed on the market a new pipe cutting and threading machine. It is called, for purposes of identification, No. 3 F machine when arranged for hand power only, and No. 3 F power machine when arranged for either hand or power. It may be run either as a power machine in the shop, or taken from its base and carried as a hand machine on outside work. This feature is valuable, as large pipe can be cut to length and threaded on the spot without the expense and delay of moving it to the shop or of cutting it to measure. It is also unusual for its range, cutting off and threading as it does all sizes of wrought-iron pipe from 1 to 6 inches inclusive, right hand. Left-hand dies can be obtained for this size of machine if desired.

The gearing is so powerful that, when the machine is in use as a hand machine, one man can with ease cut off and thread 6-inch pipe. In this design of machine the pipe is held stationary and the comparatively light dies are revolved around it. The dies are all made opening to avoid running back over the thread, and are adjustable to any variation of fittings. Only six sets of dies are used for threading the 11 sizes of pipe within its range, thus avoiding changes of dies.

To operate, the pipe is put into the machine from the back, with the end to be threaded against the back of the dies and clamped by the self-centering vise attached to the back of the shell. The dies are set to the required size by turning the face plate to the graduation for the size of pipe to be threaded. As the large die carrying gear is revolved, a slight pressure on the lever shown on the top of the machine causes it to recede into the shell and thus feeds the dies to the pipe. When the thread is cut the dies are thrown back and the pipe taken out without running back over the thread. The machine is made as shown for either hand or power, or without the power base, gearing, countershaft, &c., for hand use only. The weight of this machine when arranged for hand power only is about 325 pounds, and with power attachment 515 pounds.



THE CURTIS PIPE CUTTING AND THREADING MACHINE.

The business men's and manufacturers' jubilee, held on the 12th inst. at Beloit, Wis., in the new machine shop of the Berlin Machine Works, proved an enjoyable success. Fully 800 persons were present, the business men and mechanics joining. The festival was arranged as a jubilee over the continued success of Beloit, and especially over the completion of the new shops of the Berlin company. Dr. C. W. Merriman presided at the banquet as toastmaster.

The new steamer "Gigantic," which it is reported from London will be built by Harland & Wolff for the White Star Line, will be 700 feet long, 65 feet 7½ inches broad, will have 45,000 horse-power and will steam 25 knots, but be capable of attaining 27 knots, and going across the Atlantic from port to port in four days and a half. It is said she will be ready for sea in April, 1894.

The Luciss Ship Company of St. Louis have made a contract with the Iowa Iron Works of Dubuque, Iowa, to build the first vessel of a new type, at a cost of $200,000. Of this sum the Iron Works Company take $30,000 in stock. The ship is to be 230 feet long and 40 feet beam, with a freight capacity of 1000 tons net on 7 feet draft of water, and 1500 tons on a draft of 9 feet. She is to be built of steel and will have a double set of engines, twin screws, and a speed of 16 knots. The first vessel is to be a freight boat, to run between St. Louis and the Gulf of Mexico and between Gulf and Atlantic and river ports of Mexico and Central South America.

A writer in Palestine says that country will soon be covered with a network of railways. Besides the railroad to Joppa, nearly finished, another almost 200 miles long to Damascus has been projected by an English company. Contracts have been made for the erection of numerous dwellings for Baron Rothschild's colonists. Only recently the restrictions excluding Jews from Palestine were removed.

THE MINING ENGINEERS.

THE SCHUYLKILL VALLEY MEETING.

The charming Neversink Hotel, on the mountain above Reading, was the gathering place of about 100 members of the American Institute of Mining Engineers, on Tuesday evening, October 11.

Among those present were: John Birkinbine, president; S. T. Wellman of the Wellman Iron & Steel Company; W. H. Morris, president Pottstown Iron Company; Jos. Hartshorne, manager steel works, Stowe, Pa.; Andrew Wheeler of Morris, Wheeler & Co., Philadelphia, Pa.; Jos. Platt, Waterford, N. Y.; Dr. David T. Day, United States Geological Survey, Washington; G. A. Bell, general manager Troy Steel & Iron Company, Troy, N. Y.; W. L. Sheafer, Pottsville, Pa.; W. F. Durfee, West Brighton; F. E. Bachman, manager Salem Furnace Company, Salem, Va.; H. S. Munroe, professor Columbia College, New York; W. S. Hungerford, Ames & Co., Jersey City; E. S. Cook, president Warwick Iron Company, Pottstown, Pa.; W. McIlvain, McIlvain & Sons, Reading, Pa.; Henry R. Eckert, Henry Clay furnaces, Reading, Pa.; Hunter Eckert, Reading, Pa.; Jerome Boyer, Reading, Pa.; E. V. D'Invilliers, Philadelphia, Pa; J. H. Carpenter, president Carpenter Steel Company, Reading, Pa.; A. A. Weimer, Weimer Machine Company, Lebanon, Pa.; H. M. Howe, Boston, Pa.; David Baker, Maryland Steel Company, Sparrow's Point, Md.; C. R. Ellicott, Catoctin furnace, Md.; Thomas S. Disston, Tacony, Pa.; John S. Fackenthal, general manager Glendon Iron Company, Easton, Pa.; E. Russel Tratman, *Engineering News*, New York; Edward H. Sanborn, *Manufacturers' Record*, Baltimore; Rufus J. Foster, *Colliery Engineer*; R. P. Rothwell, *Engineering and Mining Journal*; Jos. D. Weeks, *American Manufacturer*; C. Kirchhoff, editor *The Iron Age*; Thomas Hobson, Philadelphia representative *The Iron Age*; Washington Jones, Philadelphia; H. M. McCormick, Jr., Harrisburg, Pa.; Noel B. Wittman, E. & G. Brooke Iron Company, Birdsboro, Pa.; Dr. Sweet, Philadelphia; Charles Bailey, Pittsburgh, Pa.; W. H. Pettee, Ann Arbor, Mich.; E. K. Landis, Philadelphia, Pa.; W. W. Lindsay. Barr Steam Pump Company, Philadelphia; P. H. Griffin, Buffalo, N. Y.; F. C. Smink, general manager Reading Iron Company; W. M. Kaufman, Sheridan Furnaces; G. Brooke, president E. & G. Brooke Iron Company, Birdsboro, Pa.; James Gayley, manager Edgar Thomson Steel Works, Pittsburgh, Pa.; H. S. Chauvenet, Wellman Iron & Steel Company; E. G. Spilsbury, general manager Trenton Iron Company; B. F. Fackenthal, Durham Furnace, Riegelsville, Pa.; W. G. Neilson, Philadelphia; W. E. Coxe, Reading, Pa.; L. W. Francis of Witherbee, Sherman & Co.; R. E. Jennings, West Bergen Steel Works; Albert Broden general manager Keystone and Reading Furnaces; G. F. Baer, Reading Iron Company; E. Mickley of Mickleys, Pa.; Oberlin Smith, president Ferracute Machine Company, Bridgeton, N. J.; Eckley B. Coxe of Drifton, Pa.; George Ormrod, J. S. Robeson, Pottstown Iron Company, Pottstown, Pa.; William Atkins, president Pottsville Iron & Steel Company; Baird Halberstadt, Pottsville, Pa.; E. Earnshaw, Philadelphia; Henry C. Grittinger, Lebonon, Pa.

Jerome L. Boyer, chairman of the local committee, extended to the institute a cordial welcome to Reading and the Schuylkill Valley, supported by John F. Daniell, chairman of the Board of Trade Reception Committee, and Henry S. Eckert of Reading. Their greetings were appropriately responded to by the president, John Birkinbine of Philadelphia, who then delivered an address, dealing with the early history and the resources of the Schuylkill Valley.

The President's Address.

It is just 200 years since iron was first made in Pennsylvania. What this iron was, or where or by whom it was produced, is uncertain, but James M. Swank, in his magnificent work, "The Manufacture of Iron in All Ages," gives 1692 as the date when iron was first made in the State of Pennsylvania, and copies the following verse as the only record of this production:

"A certain place here is, where some begun
to Try some mettle, and have made it run.
Wherein was iron absolutely found,
At once was known about some Forty Pound."

One who, 170 years ago, stood on the summit of this Neversink Mountain, might (had the atmospheric conditions been favorable and the timber somewhat removed) noticed in the daytime the smoke, or at night the reflection from the first successful Pennsylvania iron enterprises, scarcely 15 miles to the south of where we meet, viz.: the Bloomery forge, built in 1716, and the Colebrookdale blast furnace, erected in 1720, respectively three and eight miles distant from Pottstown. Here the pioneers of iron production in this State (which has so long led and which still leads all others in this specialty of manufacture) had their trials and successes, and it may be a satisfaction to some who bewail a present depression in trade, and the low prices now ruling, to recall the fact that in 1731 pig iron is reported to have been sold "in large quantities" at the Colebrookdale furnace at £5. 10s. Pennsylvania currency per ton, equivalent to $15 in gold.

In the two decades following 1720 a number of furnaces and forges were located where they would be distinctly visible from the Neversink Mountain; the plants, starting from the vicinity of Pottstown as a center, spread out toward Reading and also in other directions.

To the southwest of Pottstown was the Warwick Furnace, which attained considerable prominence, having been built in 1738, and remained active for 130 years, in that time acquiring a reputation for its product of pig iron and castings, some of the latter being munitions of war used in our struggle for independence. The Warwick Furnace, now at Pottstown, which will be visited, has borrowed the name of the old plant, but its successful management by a member of the institute has given it a glory of its own. During the time the old Warwick Furnace was active it was considered one of the largest in the country, its hight being 32 feet and its bosh varying from 7½ to 9 feet in diameter in different blasts. This old stone stack, blown with wooden bellows, produced from 25 to 30 tons of iron per week, sometimes reaching the then extraordinary output of 40 tons. Its present namesake, an iron shell supported on columns with modern equipment, has a hight of 70 feet and a diameter at the bosh of 16 feet, has been averaging 750 tons of pig iron per week and reached an output of 875 tons per week. With the remodeled furnace, powerful blowing engines, and the equipment of hot-blast stoves lately erected, still better results are anticipated, but a comparison of the records of the old and new Warwick furnaces cannot but suggest many thoughts to those who have followed the development of our iron industry.

It is natural that the early establishment of the iron works in the vicinity of what is now Pottstown should have encouraged the settlement there of those interested in iron manufacture, and while the ancestors of some of those now engaged in this specialty have for a century and a half been "ironmasters," none of the industries to be visited in the vicinity of Pottstown are 50 years of age. In less than half a century the large developments which will be exhibited have grown up, ending in the complete establishment, built five years ago, which has the credit of being the first plant specially erected for producing basic Bessemer steel in the country. The Pottstown Iron Company is also the pioneer in commercially producing fertilizers from basic slag. The company's works have grown from a small plant employing 200 men to one which now requires 2000 men to operate its blast furnace, steel works and mills, costing $3,000,000, and turning out nearly 1000 tons of product daily. Similar comparative statements could be presented of other industries of Pottstown and vicinity, while the story of Glasgow and the still older Pine Iron Works offer facts for interesting historical sketches, but these can be referred to only.

At Birdsboro the institute visit territory which has been continuously occupied by iron works since 1740, when the first forge was located at that point; the Bird mansion erected in connection with the forges at Birdsboro is still standing, bearing the date of 1751.

One of the first rolling mills in the country, a slitting mill and a nail works were in operation here before the Revolutionary war, this old rolling mill occupying the same site as the mill now in existence. The Birdsboro Iron Works have been owned by the family of the present proprietors since 1796, and the small beginning has developed into a plant of three furnaces, producing from 50,000 to 75,000 tons of pig iron, a rolling mill and nail factory with a capacity of 250,000 kegs per annum, in addition to the baby Bessemer plant, the diamond drill works and other industries.

The story of Pottstown and Birdsboro can be practically repeated concerning the vicinity of Reading, its magnificent industries having been instigated by the earlier developments in iron manufacture, for, although the production of iron as a metal in Reading can hardly be embraced among the pioneer enterprises, its other industries gave it a prominent place as a manufacturing center, and it has maintained an enviable reputation for the construction of machinery, stoves, hardware and various productions of iron and other metals.

Fifty or sixty years ago, a view from the locality where we meet would have shown at our feet, along both flanks of this mountain range, and in each of the valleys formed by the streams flowing into the Schuylkill River, numerous blast furnaces and forges, the flames from the open tunnel heads or from the draft stacks illuminating at night the great expanse of rich agricultural territory now visible in every direction. Instead of long railway trains carrying ore, coal and stone to the furnaces and other industries, and taking the pig iron and other products away from them, horse, mule and ox teams cut the roads in great furrows, and canal boats quietly glided by with the material for or the product of the iron works. We see distinctly the smoke from Robesonia, where a pretentious plant has taken the place of the Reading Furnace, built just a century ago, which has been sustained by and grown upon a perpetual grant of "sufficient ore for one furnace," taken from the Cornwall ore hills without royalty.

The earlier furnaces and forges also located beyond the Schuylkill Valley at points convenient to other deposits of iron ore than the local brown hematites and

magnetites, but within a radius of 35 miles of Reading the pioneer iron industry of the State was established and developed. Over in Lancaster County was the Elizabeth Furnace (claimed as the first to transport the Cornwall ores), associated with legends of Baron Stiegel, maintaining a ducal mansion, his arrival at the furnace being signaled by the booming of cannon, the blaring of trumpets and the baying of numerous packs of hounds. It was at Elizabeth Furnace where some of the first American stoves were made, one of these bearing the inscription—

Baron Stiegel ist der Mann
Der die Ofen machen kann.

"Baron Stiegel is the man who knows how to make stoves." On the original Elizabeth Furnace, built in 1750, the legend is said to have been inscribed:

Johann Huber, der erste Deutsche Mann
Der das Eisenwerk vollfuhren kann.

"John Huber is the first German who knows how to make iron."

Within the radius of 35 miles is the Cornwall charcoal furnace, the oldest in the country, still standing, to celebrate this year its 150th anniversary, and close by is that wonderful mass of soft, magnetic iron ore, known as the Cornwall ore hills, from which up to the present time 12,000,000 tons have been won, a greater amount of iron ore than has been obtained from any other single locality in the country. This old furnace passed through various changes in machinery equipment, from the leathern bellows to the wooden and iron blowing tubs driven by water power, its last campaigns being made with a steam engine supplementing the water wheel, but it was always blown with cold blast and worked with an open top; stone hearths only have been used.

To the north, beyond our line of vision, but still within the 35-mile radius, was the furnace near Pottsville which first introduced the hot blast, and which first successfully produced anthracite pig iron; and in the city of Pottsville was the Pioneer furnace which won a liberal premium for having been the first American blast furnace in continuous operation on anthracite fuel alone for three months.

Within the 35-mile limit to the east the first president of this institute, David Thomas, was instrumental in further solving this interesting problem and demonstrating in 1840 the practicability of the use of anthracite coal in place of charcoal.

The use of bituminous coal naturally followed that of anthracite, and the iron industry was relieved of anxiety as to a sufficiency of fuel, which dependence upon charcoal had encouraged, thus permitting an expansion of the volume of business. For it is doubtful if even with the improved appliances, and with careful reforestration, the United States could have, or could now produce, one-fourth of its present output of pig iron if charcoal was the only fuel available for smelting purposes.

The president closed with a review of the development and resources of the Schuylkill anthracite region.

N. B. Wittman of Birdsboro read a paper on

The Brown Segmental Wire Gun.

The system consists essentially of the subdivision of the inner core or tube of the gun, which takes up the initial compression, into longitudinal segments of such size that a higher physical condition and degree of special elasticity may be set up therein than it is possible to produce in the larger masses of metal heretofore used for the tube of the modern high-power canon.

The process consists in winding layers of square steel wire, subjected to a constant tension of 130,000 pounds per square inch, around these segments, which, when so held together, form the tube of the gun. A lining tube may or may not be used.

The steel segments used in the gun now under construction are 18 feet 4 inches long and 3 inches thick at the breech, from which they taper to 0.8 inches at the muzzle. The physical condition of the segments has been determined by a test piece, cut from each end of each segment, which showed the following characteristics:

Tensile strength, 165,000 pounds per square inch. Elastic limit, 105,000 pounds per square inch. Elongation at rupture, 14 per cent. in 2 inches.

They are of crucible chrome steel, made by the Carpenter Steel Works, at Reading, Pa. The wire which holds them together has 0.005 square inches sectional area and is wound under a constant tension of 650 pounds on each strand, equivalent to 130,000 pounds per square inch. The winding has been done by a machine designed for the purpose by J. A. Brown, the inventor. It consists essentially of a windlass and series of rollers, which act as a clutch, by which a weight is attached to the wire and which is fitted with a friction-brake, automatically regulating the speed of the passage of the wire through the machine. This speed being kept the same as that of the winding, the weight is thus held at a fixed hight, insuring a constant and absolutely uniform tension upon the wire.

The wire used has the following physical qualities:

Tensile strength, 250,000 pounds per square inch. Elastic limit, 200,000 pounds per square inch. Torsional strength, 30 full turns in 8 inches before breaking.

Following the curve of maximum pressure, the segments are wound at the breech with 33 layers of wire, making a total thickness at that place of 2.31 inches of wire, and a layer is dropped at each 10 inches, so that there are but 10 layers at the muzzle, giving at that point a thickness of 0.71 inches. Altogether, 3256 pounds of wire were used, equivalent to a single strand extending in a straight line 37 miles.

The wire was anchored at each end by a special device invented by Mr. Brown. As no flow of metal will occur below the elastic limit of the steel of which the segments are made, enlargement of the bore will not take place below a pressure of 94,000 pounds per square inch, this being 94 per cent. of the elastic limit, if that limit be taken at 100,000 pounds per square inch (the minimum obtained from any one of the test pieces).

As the pressure between the segments at the surface of the bore, induced by winding, is 100,000 pounds per square inch, it will require a powder pressure of 63,200 pounds per square inch to reduce of this compression to zero.

In order to demonstrate practically the truth of this proposition, a stub representing the powder chamber of the gun, was made and incased in a steel jacket, into the ends of which heavy plugs were screwed, entirely closing the powder chamber, with the exception of an aperture 0.2 inch in diameter, to serve as a gas vent and firing orifice. This has been fired repeatedly, with a charge which generated in all cases over 50,000, often over 60,000, and on four occasions over 66,000 pounds per square inch; and in every instance without the slightest indication of displacement of the segments or enlargement of the bore.

The trunnions are attached to a trunnion jacket, which is screwed to the breech of the gun. The major portion of the longitudinal thrust produced by firing is taken up by this jacket, and not by the inner tube. This is one of the special features of this system of construction.

The chace of the gun (that is, that part in advance of the trunnions), is protected from the effect of small arm and machine-gun fire by a steel jacket shrunk upon it.

The breech block presents some novel features in the way of simplicity of design and the maintenance of efficiency, in view of probable rough usage in actual service. A continuous thread is used, and when the block is thrown open for charging a latch locks it, so that it cannot be turned until it enters the breech. This insures proper centering of the threads under all circumstances, and a consequent minimum of wear.

The service charge of a gun of this size, made in the usual way by shrinking steel hoops over a central tube, is limited to a powder pressure of 37,000 pounds per square inch; while in this gun the ordinary charge will generate 50,000 pounds pressure, and 60,000 pounds per square inch can be reached with entire safety.

N. J. McGee of Washington presented a report on the Aerial Surveys of the United States Geological Survey, the session closing with the election of a large number of new members.

The Wednesday morning session was opened by the presentation by Frank A. Hill of Dunbar, Pa., of a paper on "The Mill Farm Parrish Mine Fire."

The chief interest of the morning session centered on the paper presented by Joseph Hartshorne, of Stowe, Pa., on

The Basic Bessemer Plant at Pottstown,

which has undergone some modifications since it was fully described and illustrated in *The Iron Age*. The Pottstown Iron Company prepare their converter lining material in accordance with the methods of Ernst Bertrand of Kladno, Bohemia. They use a limestone low in silica, containing not more than 1.5 per cent. of magnesia, oxide of iron and alumina. The limestone is crushed and ground. It is then mixed with about 2 per cent. of ground basic cinder, is shoveled into a dry mixer, from which it passes into a wet mixer, and is made into brick by machinery, four men and an engineer making 10,000 brick in ten hours. The brick are piled wet into ovens, where they are fired, first at a low and then at a very high temperature, the burning lasting on an average 36 to 38 hours, with a fuel consumption of about 2700 pounds per ton of burnt brick, which shrink 60 per cent. in firing. The product is ground and mixed with 10 to 12 per cent. tar in the converting mill. Mr. Hartshorne states that the addition of basic cinder to the lime sinters the material together, makes the bricks harder and more compact. He estimates that its use has added about 20 heats to the life of the vessel linings.

The lime for the additions is calcined in kilns, of which two are in use, with a third building. Their average product is 25,000 pounds per kiln for 24 hours, with a consumption of 300 pounds of semi-bituminous coal per gross ton of lime.

In the converting mill is an open-hearth furnace 11 feet wide between walls and 16 feet long between posts, making 12 to 14 heats per week with a fuel consumption of 800 pounds per ton of ingots, heating up included.

The Bessemer plant has two cupolas, and a third nearly completed. They are 10 feet in the shell and 24 feet from charging door to tapping holes, have 19.6 inch tuyeres, and do not quite hold a melted vessel charge. The cupolas in use are fitted with the Greiner attachment, which it is estimated effects a saving of about 20 per cent. in the fuel. Owing to the necessity for melting very hot, the fuel ratio is higher than it would otherwise be. As much as 64,000 pounds of

iron have been melted in one hour in one cupola. When using coke 14 pounds of iron have been melted per pound of fuel, not including bed.

There are three converters, two of 10 and one of 13 tons The average thickness of the lining is 15 inches, which is rammed up in the ordinary manner. The bottom has seven tuyeres, 24 inches long, each of which has seven $\frac{1}{2}$ inch holes. It takes 36 hours to ram up a vessel and about 48 hours from heat to heat. The average life of a lining is about 150 heats. The bottoms have a record of over 1500 heats, the average of the past year being between 800 and 1000 heats. During the six months ending June 30, 1892, there were used an average of 1.9 tuyeres to a blow. Since July 1 the average has been 1.17 to a blow.

The blooming train is 36 inches between pinion centers. The rolls are 30 inches in diameter on the collars, with 2-inch grooves. They have 32-inch rise, so that a 36 inch slab can be edged up if necessary. The grooves are 10, 7, 5 and 4 inches in width, with a 30-inch bullhead in the middle. On these rolls squares from 4 x 4 to 15 x 15 inches and flats from 12 x $1\frac{1}{2}$ to 28 x 4 inches have been rolled. The driver roll tables, which are too light for the ingots they are now handling (being designed for 3000 pounds, while 7000-pound ingots are handled), will soon be replaced by heavier ones. At present there are only 53 feet from the rolls to the shears. With the new tables there will be 163 feet, and a hot saw is to be put in capable of cutting a square 15 x 15 inches or a slab 36 x 17 inches in size. There is also being erected, in connection with the new tables and shear, a wire rope billet and slab conveyor, built by the Trenton Iron Company, being similar to that designed by S. T. Wellman for the Wellman Iron and Steel Company. This conveyor will cover about 700 feet available loading space. The slabs and blooms will be loaded on to cars by Yale & Towne locomotive cranes, one of which is now in operation. It is also proposed to load the nail slabs for the consumption of the Pottstown Iron Company directly from the conveyor on to iron cars.

The Basic Practice.

The pig iron used by the Pottstown Iron Company has about the following composition: Silicon, from 0.5 per cent. downwards; sulphur, from 0.02 per cent. to 0.04 per cent.; manganese, about 0.8 per cent.; and phosphorus, from 2.50 to 3.0 per cent. The cupola mixture is so arranged as to contain about 0.3 per cent. or less of silicon, 0.03 per cent. of sulphur, 0.6 per cent. of manganese and phosphorus, as required by circumstances. The initial temperature should be as great as possible to reduce the tendency to "stop." The l me, of which 11 5 to 13 per cent. is used, is charged cold into the vessel and the iron is poured directly upon it.

The two blowing engines are run at 50 revolutions per minute. A boy sits at the throttle of each engine and keeps it at a regular and similar speed, such regularity having been attained that the engines do not vary from each other more than five revolutions in a thousand. The blast pressure is maintained at 28 to 30 pounds. Each engine is connected with two revolution counters placed in the blowing pulpit. These four counters are so arranged that the movement of a lever throws either pair into operation, or all of them on to a dead center. When the vessel is turned up the lever is thrown to the right, and one counter from each engine goes into operation. When the "change" comes the lever is thrown full over to the left and the other pair of counters start to work. As all the counters are set to zero before the blow begins, the number of revolutions required for each division of the blow is thus obtained without danger of overreaching the figures and without the necessity for any calculations.

The best results are obtained by keeping the metal as hot as possible during the first part of the blow, and then cooling it down to a point which will just allow the cast to be made without "skull" in the ladle. It is much better to have a small "skull" than to cast the metal too hot. Comparatively low final temperature insures a sufficiently viscid slag to prevent rephosphorization in the ladle. If the "slag" is too thin, either from too high temperature or because it has a low melting point from not being basic enough, it will dissolve the silica ladle lining. This will set up reactions which allow some of the phosphorus to pass back from the slag into the steel. This has been proved by taking samples from the vessel before pouring and others from the ingots, as cast. If the slag is too thin, the latter are invariably higher in phosphorus. It is also shown by the fact that, in the rare cases, where there is any difference between the ingots, the last one is almost invariable the higher in phosphorus.

The "change" is determined by means of the spectroscope. The length of the afterblow is determined by the amount of air blown through the metal, measured by counting the revolutions of the blowing engine. In deciding when to turn down the vessel no attention is paid to the element of time, nor to any indications given by the smoke or flame. The average length of the blow, on the charge of 26,000 pounds, is 16 minutes. The foreblow averages 11 minutes, and the afterblow 5 minutes in length. There have been, however, many blows lasting from 20 to 25 minutes. The longest blow was 52 minutes, and the shortest 3 minutes, the latter on a charge of 18,000 pounds. The longest afterblow was 18 minutes, and the shortest 1 minute 18 seconds, on an 18,000 pound charge.

As the vessel turns down, the ferro is dropped into it by means of the lime shutes. It passes immediately through the slag, but is hardly melted before the vessel comes to rest in the horizontal position, the interval being only about two seconds. From 0.6 to 0.8 per cent. of 80 per cent. ferro is used.

About two-thirds of the charge is first poured into the casting ladle. When the slag begins to flow over the spout the pouring is stopped and from 1.0 to 1.5 per cent. of a 10 per cent. spiegel is thrown into the ladle. The casting is done as slowly as possible through a 2 inch nozzle. The mold is filled up to the hight of the ingot, allowed to settle, again filled up, and so on until no more metal can be added.

Mr. Hartshorne then described in detail the special series of tests which the Pottstown Iron Company have introduced, and which have been described in *The Iron Age*.

J. H. Carpenter, of the Carpenter Steel Company, Reading, informally dealt with the subject of "The Manufacture of Crucible Steel Projectiles." When presented in its final form, we shall print Mr. Carpenter's paper in full.

The afternoon was devoted to a tour among the industries of Reading, the first plant visited being Cofrode & Saylor's Reading rolling mill, where the principal feature of interest was the beam train, with its fine equipment. The vertical engines driving the train have been in service for an exceptionally long period. Then followed a visit to the new plant of the Carpenter Steel Company, where the puddling for special iron, the casting of crucible steel for projectiles and the forging and shaping of them was witnessed. The mill is also equipped for producing, rolling and hammering self-hardening and other special steels. A rapid tour through the great plant of the Reading Hardware Company and through the fine pipe mill of the Reading Iron Company concluded the rounds of the day. The evening brought a largely attended and brilliant reception and dance at the Neversink Hotel, tendered by the citizens of Reading.

Thursday's proceedings began with a visit to the basic Bessemer plant of the Pottstown Iron Company at Stowe, described in a former issue of *The Iron Age*, followed by a short inspection of the Valley mill of the Glasgow Iron Company and the plant of the Ellis & Lessig Steel and Iron Company, which enjoys the distinction of being one of the few cut-nail mills east of the Allegheny Mountains which has prospered in spite of the low prices so long characteristic of this industry. Adjoining it is the plant of Sotten Brothers, boiler makers. Again taking the train the party reached the famous furnace plant of the Warwick Iron Company, where the new Hugh Kennedy firebrick hot-blast stoves and the new Weimer blowing engine attracted particular attention. Then came a visit to the blast furnace and finishing mills of the Pottstown Iron Company.

A very neat idea was carried through by W. H. Morris, in having at different parts of the plant an exhibition of its typical raw materials and its standard products. At the furnace, which is 17 x 80 feet, and with an equipment of three Cowper Kennedy stoves makes a basic Bessemer pig iron, fine specimens of the ores, fuel, limestone and metal were shown. The party visited the puddling department of the nail mill, with 14 furnaces and 2 trains of rolls, the nail plate mill, with 20-inch grooves, and the nail factory, which has 95 machines equipped with automatic feeders. The party watched with particular interest the work of the 112-inch mill, which has only lately been equipped with cooling tables 280 feet long and with a hydraulic apparatus for turning over the plates for inspection and marking. The universal mill held a large group of the visitors for a long time. As one of its products there was shown a plate 134 feet long $\frac{7}{16}$ x 114 inch, weighing 2740 pounds.

The adjoining plant of Cofrode & Saylor's Philadelphia Bridge Works was next reached. Power riveting and the reaming of all punched holes with portable reamers driven by compressed air attracted considerable attention. The visitors watched with particular interest also the manufacture of eye-bars characteristic of the works, the best refined iron being used as the raw material. The head is made by welding a square billet on the end of the bar and shaping and punching it in one operation under a powerful steam hammer.

A few hours were then pleasantly spent inspecting the magnificent equipment, buildings and grounds of the Hill School for Boys and in partaking of luncheon. The day's excursion was concluded by a visit to the fine shop of the Pennsylvania Diamond Drill & Mfg. Company at Birdsboro, where the chief attraction was the Brown segmental wire gun.

Edgar S. Cook, president of the Warwick Iron Company of Pottstown, Pa., opened the discussion on the paper by referring to the surprise expressed by many that he, who was regarded as an advocate of iron stoves, adopted the fire-brick stove; and he considered that the introduction of the large Durham stove had led to an increase of 70 per cent. over that produced with the older equipment. At the time when the Durham stoves were put in the results which it was then believed were attainable by fire brick stoves did not justify the increased expenditure for the latter. In seven years, during which time over 200,000 tons of pig iron were made, not a single pipe of the Durham stoves was lost, and the expenditures on them did not

exceed $10. In tearing down the iron stoves some of the pipes were found in good condition. Last fall it was decided to erect brick stoves, and Mr. Cook and John Birkinbine, as consulting engineer, visited a number of plants, inspecting upward of 100 stoves in actual operation. In the selection of the type, a consideration was that equally good results could be obtained whether the duty imposed be the heating of 15,000 or of 22,000 cubic feet to 1500°, having in mind the contingency that the furnace may be forced to run on all coke. Other leading points in influencing the selection were the durability of the stove and the least lowering of temperature after one hour's blowing. With these points in view, the Hugh Kennedy stove was finally selected, and a plant of three 20 x 80 feet stoves was put up. These have been running only since the 1st, so that no definite results can be given. Thus far they seem to meet expectations. When heating 15,000 cubic feet to 1200° the drop in temperature in one hour fluctuated between 0 and 30°. On the day before the following record was made:

	On.	Off.	Drop.
No. 1	1112	1080	32
No. 2	1150	1120	30
No. 3	1150	1120	30
No. 1	1100	1100	..
No. 2	1100	1090	10
No. 3	1100	1100	.

W. H. Morris brought up the question of the temperature of the waste gas and then referred to his experience at Pottstown with the Cowper-Kennedy stoves, calling attention to the fact that there had been no trouble from an accumulation of dust. He made the point that iron stoves must keep up a back pressure to keep them from burning out, a disadvantage which is gotten rid of in brick stoves.

N. B. Wittman of Birdsboro raised the question of the influence of temperature on the sticking trouble. Some furnacemen insist that it is due to temperature being too low; others claim that temperature is not a factor in the question.

David Baker of Sparrow's Point, Md., urged that the economy of the Hugh Kennedy stove cannot be settled until the temperature of the waste gases has been determined. The design of the stove, with its single pass, does not encourage much hope for the best results. While in the Hugh Kennedy stove there are only 37 feet of checker work, there are 130 feet in the Sparrow's Point stoves, and yet a part of the gas escapes without being burned.

James Gayley of the Edgar Thomson furnaces reported that with his Cowper-Kennedy stoves he had made a test to ascertain how much heat was derived from the checker work and how much from the combustion chamber. He found that at the top the temperature had increased to 900°, while at the bottom of the combustion chamber it was 1400°. He urged that its division walls be left out. The openings must be large enough. In the first stoves put up the openings were 6 inches in diameter. In two weeks 21 per cent., and after five weeks 42 per cent., of the openings were closed up Their diameter was increased to 9 inches, since which time there has been no closing up. A very important point is to construct the stoves well. Stoves of a plant which has made 352,000 tons of iron to date cost only $25.06 for repairs.

H. S. Chauvenet of the Wellman Iron and Steel Company expressed disapproval of checker work in combustion chambers.

E. S. Cook, dealing with the question of waste gases, reported that during his visit to the Pittsburgh plant of Hugh Kennedy stoves, he found that there were no evidences of undue heat on the top of the stoves, which were heating the blast to 1400°. There 18,000 cubic feet of air are being put through the stoves, and yet the drop in temperature in one hour's blow ranged between 25° and 40°. At the Isabella plant two furnaces were banked, and yet the stoves of the one running not only heated the blast to 1400°, but also supplied the steam and ran the pumps of the two idle stacks.

W. H. Morris reported that at his furnace they were averaging silicon 0.3 and sulphur 0.03, which he believed could not be done with iron stoves. Brick stoves allow of more complete control, because they permit of the use of high heats when they are wanted.

Referring to some criticisms made by Dr. Raymond, Mr. Cook stated that the cost of four to five sections of Durham pipe with 24 pipe in each was $5000 each. Taking into consideration the larger interest account and the wages of the stove tenders, the fire-brick stoves pay if they can show a saving of 200 pounds of fuel per ton of iron. The first cost, inclusive of foundations and royalties, for the three stoves at Warwick complete is $38,000. These will heat 20,000 cubic feet per minute, while it would be necessary to add one or two more Durham stoves to heat the same volume of air. The difference in first cost is, therefore, by no means great.

B. F. Fackenthal of Durham stated that it takes only 100 Durham pipes to heat 20,000 cubic feet to 1000°. John Birkinbine expressed the conviction that special circumstances must largely decide the choice of stoves. He would select iron stoves for one place and brick for another.

The meeting closed with the reading by David Baker of a paper entitled "The Rock Drill Applied to Opening the Tapping Hole of a Blast Furnace," and one by B. Smith Lyman on "An Occurrence of Coarse Conglomerate above the Mammoth Anthracite Bed."

Favored by excellent weather the members of the institute spent Friday in a delightful trip through the Schuylkill County anthracite coal regions, stopping at the Maple Hill colliery of the Philadelphia & Reading Coal and Iron Company, which had been prepared for underground inspection in a manner never before achieved in the annals of the institute. After viewing the breaker, the party proceeded to Lakeside Park, where luncheon was served. Returning to Reading later in the afternoon, the engineers and operators of the Schuylkill region presented to each member a souvenir of the visit in the form of a series of neat photographs, the negatives of which were furnished by B. F. Patterson of the Schuylkill Camera Club, A. B. Harden and A. W. Sheafer, members of the institute.

The Secretary of the Treasury has awarded the contract for the construction of the new twin screw revenue steamer "Windom" to the Iowa Iron Works of Dubuque, Iowa, for the sum of $98,500. The contract stipulates that the vessel must be delivered in nine months at Key West, Fla. Among the bidders for the "Windom" were the Charles Hillman Ship and Engine Building Company of Philadelphia, Pa., $130,000; Charles Reed & Sons, of Baltimore, Md., $119,500; Samuel L. Moore & Sons, of Elizabethport, N. J., $119,294; Craig Shipbuilding Company of Toledo, Ohio, $123,750; Neafie & Levy Ship and Engine Building Company, Philadelphia, Pa., $114,000, and the Cowles Engine Company of New York City, $134,000. The Secretary of the Treasury has awarded the contract for the construction of the harbor vessel "Calumet" to the David Bell Shipbuilding Company of Buffalo, for $38,500. The contract just issued to the Iowa Iron Works is the first instance of a revenue cutter bid being secured by an establishment on the Mississippi River.

Pullman's Palace Car Company.

At the annual meeting of Pullman's Palace Car Company in Chicago on the 13th inst., there were $22,500,000 of the capital stock represented. The directors were re-elected as follows: George M. Pullman, Marshall Field, J. W. Doane, Norman Williams, and O. S. A. Sprague of Chicago, Henry C. Hulbert of New York, and Henry R. Reed of Boston. The usual quarterly dividend (No. 103) of $2 per share from net earnings was declared, payable November 15 to stockholders of record at close of business November 1.

Following is the income account for the fiscal year ending July 1, 1892:

Revenue.

From earnings of cars	$8,061,081.00
From patents	21,751.07
From manufacturing, rentals, dividends, interest, &c.	1,919,523.97
Total	$10,002,356.04

Disbursements.

Operating expenses, including maintenance of interior furnishings of cars, legal expenses general taxes and insurance	$3,438,862.66
Proportion of net earnings paid other interests in sleeping-car associations controlled and operated by this company	947,504.31
Interest on debenture bonds	65,600.00
Dividends on capital stock	2,300,000.00
Total	$6,751,966.97
Surplus for the year, being excess of revenue over ordinary disbursements carried to credit of income account	$3,250,389.07

The financial statement shows total assets of $53,345,050.53, and total liabilities of $31,261,370.49.

President Pullman supplemented his annual report with the following general information:

There have been built during the year 80 sleeping and dining cars, costing $1,332,906.50, or an average of $16,661.33 per car. Work is now progressing rapidly on 415 additional sleeping, dining and parlor cars to supply the anticipated extraordinary demands of travel during the year 1893. These cars are estimated to cost about $5,500,000.

The number of cars owned and controlled is 2239, of which 1985 are standard and 254 tourist or second-class cars.

The number of passengers carried during the year was 5,279,020, and the number of miles run was 191,255,656. During the previous year the number of passengers carried was 5,310,813, and the number of miles run was 186,829,836. The year just ended shows, therefore, a decrease of about one-half of 1 per cent. in the number of passengers carried, and an increase of 2⅛ per cent in the number of miles run.

The total mileage of railways covered by contracts for the operation of cars of this company is 125,111 miles.

There has been added during the fiscal year to the company's investments in shops and plant $155,783.50. The value of the manufactured product of the car works of the company for the year was $10,308,939.66, and of other industries, including rentals, $1,417,403.91, making a total of $11,726,343.57, against $13,260,471.88 for the previous year.

The average number of names on the pay-rolls at Pullman for the year was 4942, and wages paid $2,918,997.41, making an average for each person employed of $590.65, against $610.73 for the previous year.

The total number of persons in the employ of the company in its manufacturing and operating departments is 12,809, and wages paid during the year $6,619,156.63. The number of employes for the previous year was 13,885, and wages paid $7,303,108.42.

The Pullman Loan and Savings Bank shows savings deposits at the end of the fiscal year of $531,005, a gain of $74,202 over the previous year. The number of depositors has increased during the year from 1903 to 2012, and the average for each depositor has increased from $240.04 to $263.92.

The entire enrollment of pupils in public schools for the fiscal year was 1235, a slight increase over the previous year. The regular staff of teachers is 21, the same as last year.

The population of Pullman is 11,702, as shown by the last census. There are 2246 employees living in the immediate vicinity of Pullman in houses not owned by the company.

The largest cotton mill in Mexico was opened at Orizaba with a speech by President Diaz.

THE WEEK.

The effect of the removal of the restrictions by European governments on American pork is seen in the large increase of exports. For the 11 months ending September 30 the United States exported $6,000,000 worth more of bacon than for the corresponding period last year. The increase in that period in the exports of beef and hog products was $10,921,757.

A Philadelphia ship builder, John Dialogue, has closed a contract with a Trinidad merchant for the construction of a shoal water steamer, 160 feet long, to trade between ports of Spain and the Orinoco River.

Postmaster-General Wanamaker signed contracts with the International Navigation Company for ocean mail service between New York and Antwerp, in American ships of not less than 8000 tons register, calling at Southampton and Bologne. To comply with the terms of the contracts will require the construction of five new ships in addition to the City of Paris and the City of New York, now in service, costing between $8,000,000 and $9,000,000.

The imports of Alaska during the last year are shown by the Governor's annual report to have aggregated $2,164,638. The exports aggregated in value $7,759,064.

The Master Builders' Exchange in Philadelphia has received from the National Association of Great Britain a statement showing that wages are over 100 per cent. higher in Philadelphia as compared with London.

The Honduras Steamship Company of New York, in return for valuable concessions from the Government of Honduras, agree to establish plantations in the department of Santa Barbara for the growth of sugar cane and the production of sugar, alcohol, rum and vinegar; to enter upon the cultivation of wheat and tobacco, and to establish various manufactures. They also agree to bring in 5000 or more families of colonists from Europe; to establish a line of steamers between Puerto Cortez and New York, and to found a bank for the convenience of merchants and others of the country.

A timber limit composing 35½ square miles was purchased at a Government sale in Ontario last week by G. W. Peck of Alpena, Mich., at the rate of $10,600 a mile.

Great Falls, Mon., only six years old, boasts that a great steel plant will soon be started in that city.

A million dollar bridge is being erected across the Missouri River at Sioux City by the Pacific Short Line Bridge Company.

A double beam pump in Chicago broke down, reducing the daily supply 36,000,000 gallons for a month to come. Connections with the new four-mile tunnel in the lake are nearly complete.

The first vessel ever built upon the twin-screw tubular system was launched from the yard of Cochrane & Cooper, Beverly, England, recently. The idea of the new ship is to have the screws, of which there are two, right in the center of the bottom of the vessel, the water flowing through two tubes, one on each side of the keel. The boat is 94 feet long, 18½ feet broad by 8 feet deep, and she is designed to carry 180 tons.

The Spring Garden Institute of Philadelphia has this year made a new departure by opening a workshop school in wood and metal, where the pupils attend, as in a shop, eight hours a day. Their progress in hand skill is more rapid than in training schools where the pupils are limited by other studies to two hours a day in the shop.

The protected cruiser to be launched at the Union Iron Works, San Francisco, November 5, will be named the Olympia, after the capital city of Washington.

American travel to Egypt and the Holy Land has increased so much that the Hamburgh-American Steamship Company will run their four steamers, the "Fuerst Bismarck," "Augusta Victoria," "Columbia" and "Normannia," from this port to Gibraltar, Genoa and Naples during the winter.

The decline in the prices of general commodities throughout the world during the last two years forms the subject of careful inquiry by the London *Economist*, which finds that the same articles, about 200 in number, which could have been bought in New York October 1, 1890, for $95.17½, could be bought October 1, 1892, in the same markets for not more than $88.87½. Here appears a fall in American prices of 6.6 per cent. in two years, while British prices, according to the same authority, declined during the same period 10.8 per cent. The main cause assigned is the collapse of the enormous British speculation in foreign securities at the time of the Baring failure, with the subsequent failure of crops in Europe, affecting both continents.

The Compagnie Transatlantique have again brought forward the question of lighting the Atlantic route from Ireland to Newfoundland. It is proposed to moor ten powerful floating lights 200 miles apart, and connected by electric cables.

The Mexican Government is preparing to introduce 1000 colonists from Japan.

Orders have been placed with a number of brick manufacturers in Philadelphia for 6,000,000 bricks to be shipped to Cuba for the construction of buildings for molasses boiling.

The Census Bureau has issued a preliminary report of the manufacture of cotton in the United States for the census year 1890. The growth of the industry has been constant and greatly extended in the South.

Ottawa's lumber cut somewhat exceeds that of last year.

The last spike of the St. Lawrence & Adirondack Railway was driven on the 13th inst., and trains will be running into Montreal in a few days. This practically brings the Vanderbilt system into Montreal.

The railroad magnate of Chicago, Charles T. Yerkes, has authorized Alvin G. Clark to build for the Chicago University a telescope that will have a glass 45 inches in diameter, just 11 inches greater than the glass at Lick. Estimated cost, $250,000.

The Kansas winter wheat crop is estimated by the Board of Agriculture at 70,000,000 bushels; spring wheat, 4,500,000 bushels; corn, 140,000,000 bushels.

It is estimated that the cost of the improved ship canal at the Sault Ste. Marie, when completed, will be $5,000,000, and that the canal building on the Canadian side of the river will cost as much.

The October Government report indicates a wheat yield of 520,000,000, a corn yield of 1,665,000,000, an oats yield of 616,000,000 bushels. The figures all around tend to depress the grain markets. The report raises the probable wheat yield 35,000,000, the oats yield 26,000,000, and the probable corn yield 4,900,000 over the total suggested by the September report. In other words, the October report suggests 65,000,000 bushels more grain for consumption and transportation than the September report did.

The Naval Board of Inspection will be occupied several days in their examination of merchant steamships at this port to decide which of their number are eligible as cruisers and transfers, as provided by the Mail Subsidy act.

PERSONAL.

Wm. E. Harris, for the past twelve years superintendent of the Granite Iron Rolling Mills of the St. Louis Stamping Company, has resigned his position and has connected himself with the Falcon Iron & Nail Company of Niles, Ohio. As already noted in these columns, the last-named concern commenced the erection some time since of a very large plant for the manufacture of tin and terne plates.

E. J. Buffington, treasurer of the American Wire Nail Company, Anderson, Ind., returned home from a European trip last week.

Quite a number of changes have been made in the management of the Carnegie concerns. John A. Potter has resigned as superintendent of the Homestead Steel Works and has been appointed chief mechanical engineer of the Carnegie Association, with headquarters at 42 Fifth avenue, Pittsburgh. C. M. Schwab has been appointed general superintendent of the Homestead Steel Works, a post which he had filled before going to Edgar Thomson. He is succeeded as superintendent of the Edgar Thomson Steel Works by James Gayley, who has hitherto been the superintendent of the furnace plant. The latter post is now filled by D. G. Kerr. All these appointments went into effect on the 18th instant.

There are rumors in circulation of a very important consolidation of interests in the wire trade. It is reported that the St. Louis Wire Mill Company of St. Louis, the Lambert & Bishop Wire Fence Company of Joliet, the Baker Wire Company of Lockport, the Braddock Wire Company of Braddock, Pa., and the Iowa Barb Wire Company of Allentown, interests which have been closely associated for some time past, will be consolidated under one management, and that the Elwood plant of De Kalb, Ill., will also go into the organization. It is hinted that one of the objects of the consolidation is to build blast furnaces and steel plant to manufacture the billets consumed by the rod mills of the companies.

The Louisville & Nashville has decided to build an extension of the Cumberland Valley division in Southeastern Kentucky from a point near Pineville up Clear Creek, a distance of 12 miles, passing through the Log Mountain coal and timber district. The district comprises over 30,000 acres, all owned by Messrs. F. A. Hull of Danbury, Conn.; Thomas Cairns, H. P. Wyman and Dwight Cutler of Grand Haven, Mich., who have organized the Log Mountain Coal, Coke & Lumber Company, with $2,000,000 capital. The main office has been located at Pineville.

A serious error occurred in the report, published in *The Iron Age*, October 6, 1892, page 619, of the results of tests with the Meneely tubular bearing on the Delaware & Hudson Canal Company. The coal test showed a consumption of 14,800 pounds in running 270 miles, with brass bearings, against 11,100 pounds when the train was equipped with the Meneely tubular bearings.

The Iron Age

New York, Thursday, October 20, 1892.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Chicago's Industrial Growth.

The United States Census Bureau has just issued preliminary reports of manufacturing statistics for some of the principal cities in the country. Although two and a quarter years have elapsed since the close of the year (June 1, 1889, to May 31, 1890) for which these statistics were gathered, the reports are of interest and value as the latest authentic presentation of civic industrial growth. Taking for the sake of convenience the gains on the census year 1880 in the value of manufactured products in round millions of dollars, Chicago shows 383, New York City 291, Minneapolis 60, Kansas City, Kas., 44, Rochester 40, Kansas City, Mo., 25, St. Paul 20, St. Joseph, Mo., 6. Chicago is thus far in the lead of all the cities for which reports have been made public. The only city in the country whose figures are at all likely to approximate those of Chicago is Philadelphia, which is known to have also made great strides in its industrial growth in the decade between 1880 and 1890. Deducting from the figures for 1890 the statistics of a few industries not included in the census of 1880, the percentages of increase in Chicago in the decade were as follows:

	Per cent. increase.
Number of establishments	155
Capital invested	314
Hands employed	143
Wages paid	229
Value of product	149

The growth of the population of Chicago was phenomenal during the decade, but the rate of that growth was surpassed by the industrial progress. The increase in population was 118 per cent., while the increase in the number of hands employed in the city's industries was 143 per cent. This shows that the tendency of Chicago's business activities is more in the direction of manufacturing than of purely commercial undertakings. In its early history the city was a trading center, the *entrepôt* for a vast territory whose supplies were drawn from the East and from Europe. Its commercial houses then greatly overshadowed its insignificant factories. To-day the conditions are nearly reversed. The manufacturing establishments far surpass in importance the commercial interests, although the jobbing business of the city is very much larger than at any previous period. Take, for instance, slaughtering and meat packing, recognized as the most characteristic of Chicago's industrial lines. There were 68 establishments of this kind reported in 1890, having a capital of $40,000,000, employing 17,878 hands, paying $11,000,000 in wages, using materials costing $174,000,000, and turning out a product valued at $204,000,000. This interest alone would be equal to 200 wholesale houses handling an average of a million dollars worth of goods annually, which would be a very high average and would represent a very large aggregation of important commercial concerns. The other leading branches of manufactures shown in detail in the preliminary report are as follows: Agricultural implements, 6 establishments; steam railroad cars, 7; men's clothing, wholesale, 186; foundry and machine shop products, 212; furniture factory products, 157; iron work, architectural and ornamental, 90; distilled liquors, 3; lumber planing mill products, 116; soap and candles, 15. In these leading lines of manufacture only such industries as have three or more establishments engaged in them are included, so as to avoid disclosure of operations of individual establishments. This accounts for the omission of steel rails and other products of steel works and rolling mills from the above enumeration of leading industries. All, however, are included in the totals of the report as follows:

	1880.	1890.
Industries reported	189	255
Establishments reporting	3,519	9,059
Capital	$68,836,885	$292,477,068
Hands employed	79,414	203,108
Wages paid	$34,653,462	$119,146,357
Cost of material used	179,209,610	386,814,848
Value of product	249,022,948	632,184,140
Population	503,185	1,099,850

An important fact brought out by the details published is an actual increase in the average wages per hand in 1890 over 1880. The average earnings in 1880 were $436, while in 1890 they were $589, or a gain of 35 per cent. This, however, is explained by the census officials to be due partly to the employment, relatively, of more men in 1890 and less children, partly to the employment, relatively, of less women, and partly to the improvement of the grades of products in many branches of industry, therefore requiring more skilled and higher paid employees. Yet they state that after making all possible allowance for these changes there is still shown a decided relative increase in the amount paid in wages in the two census years compared.

The value of the total product at the place of manufacture in the city in 1890 is put at a little in excess of $632,000,000. This is a stupendous aggregate for a city which could hardly be found on any map of the United States only 50 years ago. It places Chicago among the great manufacturing centers of the world, giving her an industrial position even higher than that secured by her great growth in population. But it must further be borne in mind that Chicago to-day is much in advance of the position occupied even two years ago. The industrial growth of the city has been rapid in that time. Numerous manufacturing suburbs have sprung up, old establishments have enlarged and many new ones have started, while removals have taken place to the city of factories located elsewhere. If the present rate of progress continues all through the decade upon which we have now entered, the census year of 1900 will as far surpass that of 1890 as the latter has exceeded that of 1880.

Sources of Prosperity.

After the signal deliverance last year, when crops unexampled in abundance and almost immediately converted into cash served effectually to protect this country from the disastrous effects of the Barings' failure in Europe, no business man will be disposed to disparage or underrate the importance of the reports of the Agricultural Bureau coming to hand at this turning point in the year. The report for October is of special significance in regard to the three great leading staples, wheat, corn and cotton, though in regard to the two latter no close calculation is as yet possible. In fact, so far as the prosperity of the country is related to any of these, we are yet between "hay and grass," as the great avalanche of agricultural produce that will soon clog all the channels of transportation has only fairly begun to move. Corn has scarcely reached maturity. As to cotton, it is only within a few days that Southern planters are drawing on New York for funds to move their staple to the seaboard. Although the aggregate of these crops cannot yet be determined to a certainty, the October report conveys gratifying assurances that the yield has not been overestimated, however much it might be politic with reference to the expected foreign buyer not to expatiate largely upon a delicate subject. The fact could not escape attention, however, that immediately following the publication of the document wheat became weak and lower, corn dull and heavy, hog products also declining in sympathy, showing unmistakably that the report was construed to mean greater abundance.

This intelligence was supplemented by an immediate increase of nearly 5,000,000 bushels in the available supply within a single week. Chicago dispatches state that the Western roads never in their history delivered as much grain in a week when prices in the market offered no special inducements. The business offered was enormous, taxing the transportation facilities even of the strongest companies, the receipts of cereals of all kinds, but exclusive of flour, aggregating 10,337,000 bushels, or, for two weeks together, nearly 18,000,000 bushels. As compared with the September report the wheat yield promises 30,000,000 bushels more, corn 100,000,000 bushels more and oats 50,000,000 bushels more. Total estimated increase, 180,000,000 bushels. How the result compares with the last two years appears from the following:

	1892. Millions of bushels.	1891. Millions of bushels.	1890. Millions of bushels.
Corn	1,708	2,060	1,490
Wheat	520	612	350
Oats	618	738	524
Total	2,814	3,410	2,413

The inference is unavoidable that, excepting the unprecedented year of 1891, this year's crops are larger than those of

1890 and have few parallels. Evidence to this effect receives confirmation from the pressure of grain coming forward in such quantities from primary markets and so early in the season. In fact, the movement in this respect is phenomenal, exciting much conjecture as to its real significance. It is certainly difficult to reconcile with the theory of a short crop. Western writers explain that the harvest weather has been remarkably favorable, the threshing process being uninterrupted and continued by the aid of artificial light. Moreover, farmers are said to have become convinced of the folly of holding for higher prices in the spring, especially as India and Russia may contribute a larger share to the world's supply. Then Western warehousemen may take undue advantage of an opportunity for profit. Moreover, it is not improbable that apprehensions of a car famine, occasioned by the Chicago Fair, may have some influence. At the same time it is to be noted that the rates of transportation are exceedingly low. It is charged by the boatmen on the Erie Canal that the railroads are carrying grain from Buffalo to New York for 4 cents a bushel, or about 40 cents a ton for a haul of over 400 miles, exclusive of elevator charges.

In the scramble for business, not only the Transcontinental Tariff, but the Western Traffic Association, has suddenly gone to pieces. Other considerations aside, it is not surprising that the farmer in the Dakotas and the Northwest generally decides to push his products to market at the prevailing cheap rates, even if he can realize only 42 to 45 cents per bushel, rather than assume the hazards of delay. Many lots of wheat are reported as selling in Minneapolis at about 50 cents, flour made therefrom being offered in Europe at the lowest prices known in 30 years. In New York, in September, the average of all daily quotations for No. 2 red winter wheat was only 78.65 cents, the lowest on record. Even making allowance for low valuations in regard to some products, the lowest ever known, and which is seen in the reduced volume of the export trade—shipments from New York for September being $11,000,000 below the corresponding total last year—the general outlook inspires confidence. Added to this, Clearing House returns exceed the unprecedented record of 1890, failures are few, and the Treasury is once more accumulating gold.

The evidences are multiplying that the Homestead strike is approaching its end with a complete defeat of the men. A number of the old employees have returned to work, among them some who fill important posts, and it looks as though it were becoming simply a matter of finding a pretext to go to work. The contest has cost both sides dearly, and will establish the Carnegie concerns as non-union mills. A resumption with full work will have a notable effect on the structural and plate markets. The most striking result will be witnessed in the beam trade, in which Homestead occupies a peculiarly prominent place with the great iron mill which was just getting into working order before the troubles. The capacity of this plant, in which beams are cogged and rolled direct from the ingot, is very large. Homestead is one of the few mills which can make 20-inch steel beams, and the only one which goes up to 30-inch. Its resumption at full capacity would put an end to the scarcity of this class of material—a scarcity which has led to the placing recently of large orders in Germany, it being asserted that 5000 tons of foreign beams have been sold in the American market within the last few weeks. In plates the starting of Homestead will be less keenly felt, because its product does not constitute so heavy a percentage of the total make. Still, the mill is a factor of no mean importance. It is reported that the books of the Homestead works have some old contracts which will take precedence, so that it is possible that its appearance as a seller in the markets may not come as early as a good many in the trade believe. There is one matter on which assurances may be given at an early date, and that is that the punishment of the disorderly and lawless element will be followed up relentlessly. Indifference now would simply mean encouragement to the worst trade unions element in the future.

Western Freight Prospects.

Now that the Western Traffic Association has formally dissolved, opinions seem to be pretty evenly balanced respecting the probability of a reorganization, but prominent men in the freighting business are confident that all the roads will have so much to do in the next few months that no general demoralization of rates is probable. The association, or so-called "gentlemen's agreement," formed two or three years ago, died hard. A number of railroad presidents, by absenting themselves from the meeting held on the 11th inst., prevented a quorum, but a slight informality in this respect did not prevent the settling of various outstanding bills and the passage of a resolution to adjourn without date. Eleven companies were represented, including the Little Wizard, but such important roads as the Iowa Central, Great Northern, Burlington, Southern Pacific and Illinois Central were not. Report says that Jay Gould offered a resolution that reflected severely on the Burlington, whose withdrawal a few weeks ago precipitated the crisis. Aldace F. Walker, chairman of the Board of Western Traffic Commissioners, who came to New York to attend a meeting of the Advisory Board, was of the opinion that while the pressure of business may for a time prevent demoralization, a new association will eventually be formed. It is understood that he intended to submit a proposition framed in accordance with the suggestion of several presidents, but he did not participate in the proceedings. The Walker plan for the establishment and relative adjustment of reasonable rates, it is said, was to discharge all existing freight and passenger rate committees and withdraw from all existing associations, but to preserve a general organization similar to the Advisory Board of the Western Traffic Association. Judging from the enormous amount of freight now in sight, and there being no longer any doubt about the abundance of the crops, the Western roads will not long refrain from advancing their rates, despite the dissolution of the Western Traffic Association. Such a proceeding would be natural at the close of navigation, and an added incentive is found in the probability that, so far as practicable, freight will be moved in season to avoid any accumulation at the time of the World's Fair in 1893.

CORRESPONDENCE.

Specifications for Structural Steel.

To the Editor: Of late there has been a great deal written about the testing of structural steel, and I thought that the inclosed specifications might be of interest to some of your readers, as the requirements are unique. The material is for a highway bridge, and is to be used without reaming. At first sight it is not clear just what is called for by these specifications, and for this reason I have worked out a number of cases, and find that the leeway allowed on the ultimate strength is from 2623 pounds on ¼-inch plates to 3865 pounds on ¾-inch plates. This is considerably less than one-half the usual allowance of 8000 pounds in Theo. Cooper's and other recognized standard specifications.

The following is taken from the inclosed specifications:

"In all that follows:

a = area of original bar, d = its width, and p = its perimeter—all in inches.
t = ultimate tensile strength, in pounds per square inch.
e = elastic limit, in pounds per square inch.
s = ultimate elongation in a length of 8 inches, in per cent.
r = reduction of area at the fracture, in per cent.

"All steel for shapes and plates must show by the standard test pieces at least the following results: $t = (62{,}000 - 5000 \frac{a}{p})$ but in no case to exceed 64,000; $e = (0.54\ t)$; $s = 25$, excepting for plates over 16 inches wide, $s = 22$; and for plates over 42 inches wide $s = 20$."

The shapes in this investigation may be considered as represented by bent plates, and we have the following:

Minimum Ultimate Strength.

Size of plates	¼ inch thick.	⅜ inch thick.	½ inch thick.	⅝ inch thick.	¾ inch thick.
12 inches wide.	61,390	61,090	60,800	60.515	60,240
24 inches wide.	61,380	61,075	60,775	60,475	60,185
36 inches wide.	61,380	61,070	60,765	60,465	60,165
48 inches wide.	61,380	61,070	60,765	60,465	60.155
60 inches wide.	61,380	61,070	60,760	60,455	60,150
72 inches wide	61,378	61,065	60.760	60,455	60,140
84 inches wide.	61,377	61,065	60,755	60,450	60,140
96 inches wide.	61,377	61,065	60,755	60,450	60,135

Variation Allowed in Ultimate Strength.

Size of plates.	¼ inch thick.	⅜ inch thick.	½ inch thick.	⅝ inch thick.	¾ inch thick.
12 inches wide	2,610	2,910	3,200	3,485	3,760
24 inches wide.	2,615	2,925	3,225	3,525	3,815
36 inches wide.	2,620	2,930	3,235	3,535	3,835
48 inches wide.	2,620	2,930	3,235	3,535	3,845
60 inches wide.	2,620	2,930	3,240	3,545	3,850
72 inches wide.	2,622	2,935	3,240	3,545	3,860
84 inches wide.	2,623	2,935	3,245	3,550	3,860
96 inches wide.	2,623	2,935	3,245	3,550	3,865

The tabulated statement of the 40 cases I have worked out covers the endless

number of cases that would come up in the practical working of plates between the limits of 12 to 96 inches in width and ¼ to ⅞ inches in thickness. The ground covered by the above complicated and useless formula is embodied by the simple statement: Ultimate strength 60 to 64,000 pounds, elastic limit not less than 32,500 pounds. Stretch same as above. But it seems that this would not answer; it is too commonplace, and we have another "striking instance of how completely the most simple facts may be buried out of sight under heaps of mathematical rubbish."

New specifications for structural steel are appearing every day, and the terms soft steel and medium steel now mean little or nothing, and when the grade of steel is settled by the limits of the ultimate strength being given then comes in the matter of elongation called for on the given grade of steel. This varies very much. 1. As to per cent. 2. As to the length on which the percentage of stretch is to be calculated. 3. As to whether the stretch is to be measured before or after fracture. After all this come in the limits imposed by some as to the shape and size of the pieces allowed.

In all specifications for iron, allowances are made for thickness, size and various shapes of material being rolled, but in steel as a general thing the mills are expected to furnish a material that will give the same results on all sizes and sections. This is impracticable and causes trouble. Dr. Dudley, chemist of the Pennsylvania Railroad Company, in his recent paper before the Institute of Mining Engineers, made some very good suggestions, to wit —"First find out by experience just what grade of material you want, and then see how near the mills, with reasonable care and equipment, can come to making this material." If this was followed out by those getting up new specifications, the class of specifications as represented by the inclosed would soon disappear, and with them the endless trouble which now exists between the mills and the inspectors.

I have written the above in hopes that some of the engineers and manufacturers would discuss these specifications through your valued paper, giving the advantages of requirements calling for such close limits and the practical difficulties of making steel to meet them. A free expression of opinions on these matters and the other points alluded to might help to clear up some of the present confusion, and would be of the greatest service to both the engineers and the manufacturers.

Yours truly,

WM. R. WEBSTER, C. E.

POTTSTOWN, PA., October 8, 1892.

The specification referred to in the above letter is as follows:

WROUGHT IRON AND STEEL—GENERAL.

No specific process or provision of manufacture will be demanded, provided all the requirements of these specifications are fulfilled.

A variation of 2½ per cent. in the weight of cross section of any rolled material from that specified may be cause for its rejection.

When the thickness of bars is at or near the maximum that rolls will work the same perfection of finish will not be required as for thinner ones, but the edges of all such bars must be straight, not serrated.

The contractor shall promptly furnish the Bureau of Surveys, through the mill inspector, copies of the manifests or shipping bills of all finished materials forwarded to the bridge site.

Pins of greater diameter than 4½ inches must be forged.

The standard test piece shall be 1 inch wide and from ½ to ¾ inch thick, to be cut from full-sized bars and having its sides planed straight and parallel for a length of at least 8 inches. Whenever practicable, its sides shall be left as they come from the rolls, but in all cases the finish of opposite sides must be alike in this respect.

The contractor will be required to prepare and furnish at his own expense all specimens for tensile, bending and drifting tests, and all full-sized bars for testing to destruction, necessary to fully satisfy the chief engineer as to the quality of the materials. All these tests are to be made at the expense of the contractor.

In all that follows

a = area of original bar, d = its width and p = its perimeter, all inches.
t = ultimate tensile strength, in pounds per square inch.
e = elastic limit, in pounds per square inch.
s = ultimate elongation in a length of 8 inches, in per cent.
r = reduction of area at the fracture, in per cent.

WROUGHT IRON.

All wrought iron must be tough, ductile and fibrous, of uniform quality for each class, straight and smooth, free from cinder pockets, injurious flaws, buckles, blisters or cracks, and must have a workmanlike finish.

All iron for use in tensile members of trusses or laterals, pins, bolts and rivets, except plate and shape iron, must show by the standard test pieces at least the following results: $t = (52{,}000 - 5000 \frac{a}{p})$ $e = (0.52\ t)$ and $s = 20$.

All iron for use as fillers, bearing and bed plates must show by the standard test pieces at least the following results: $t = 46{,}000$, $e = (0.5\ t)$ and $s = 5$.

All other iron must show by the standard test pieces at least the following results: $t = (50{,}000 - 5000 \frac{a}{p})$ $e = (0.5\ t)$, and $s = 15$, except plates over 16 inches wide $s = 12$, and for plates over 42 inches wide $s = 10$.

All iron must be capable of bending cold without sign of fracture on the convex side, around a curve whose radius is not greater than one and a half times the thickness of the piece tested through the following arcs: Iron of the first class, 180°; iron of the second class, 90°; iron of the third class, 140°, and rivet iron, of the full diameter of the rivet, must also be capable of bending upon itself until its sides are in close contact.

All iron that is to bend hot in the working must, in addition to the above requirements, be capable of bending sharply 90° at a working heat.

Full-sized eye-bars or rods, if required to be tested to destruction, shall part in the body, but in no case will the lot represented by such test bars be accepted, unless there shall be developed in the body at least the following results: $t = (52{,}000 - 5{,}000 \frac{a}{p}) - 1000\ d$, with an ultimate elongation of 8 per cent. in a length of not less than 10 feet.

At least one standard test piece shall be furnished for each different cross section rolled, or for each 20,000 pounds thereof, and for each different rolling of the same.

STEEL.

All steel must be tough and ductile, of uniform quality and silky texture, straight and smooth, free from laminations, injurious surface defects, and must be made from uniform stock and have a workmanlike finish.

The contractor will be required to furnish the Bureau of Surveys, through the mill inspector, full reports of manufacturer's analyses of all the melts of the metal used in this work. These reports are to show the percentages of carbon, phosphorous and manganese present in the metal, and must be certified by a chemist acceptable to the Director of Department of Public Works.

In acid open-hearth steel, the phosphorus present must not exceed 0.10 per cent., nor average over 0.08 per cent. in any ten successive melts of the metal, while in the Bessemer or basic products it must not exceed 0.08 per cent., nor average over 0.06 per cent. in any ten successive melts.

Steel for use in eye-bars and pins must show by the standard test pieces the following results: $t = (62{,}000$ to $68{,}000)$, $e = (0.52\ t)$, $r = 40$ and $s = 22$

All other steel, except rivet steel, must show by the standard test pieces at least the following results: $t = (62{,}000 - 5000 \frac{a}{p})$ but in no case to exceed 64,000; $e = (0.54\ t)$, $s = 25$, excepting for plates over 16 inches wide, $s = 22$, and for plates over 42 inches wide $s = 20$.

All steel must be capable of bending cold without sign of fracture on the convex side. 1. When not hardened, doubled on itself until its sides are in close contact. 2. When hardened (by heating to a cherry-red and quenching in water at a temperature of 82° F.), 180° around a curve whose radius is not greater than 1½ times the thickness of the piece tested; and rivet steel of the full diameter of the rivet, double on itself until its sides are in close contact.

When holes are punched in a plate or bar of this metal whose centers are a distance of three times their common diameter from its edge and each other it must be capable of having their diameter enlarged 25 per cent. by the aid of drift pins without sign of fracture.

Every steel piece must be stamped with its proper blow or melt number, and at least one standard test piece shall be furnished for each different cross section rolled from metal of the same melt, or when but one cross section is being rolled, then at least one standard piece shall be furnished from each melt of metal used or 20,000 pounds thereof.

In all cases where a steel bar requires in the finishing either bending hot or forging the whole of every such bar must be subsequently annealed.

No steel bar shall be worked or hammered at or near a black heat.

At least two full-sized eye bars or rods for each span, or, at the discretion of the chief engineer, at least one for each 40 bars made, shall be furnished by the contractor and tested to destruction. If in such test the bar fails in the eye, or there be not developed in the body at least the following results: $t = (62{,}000 - 5000) = 1000\ d$, with an ultimate elongation of 10 per cent. in a length of not less than 10 feet, then the entire lot represented shall be rejected.

For rivet steel the value of r must be at least 50, that of t not more than 60,000, and $s = 25$. Test rivets having a grip of 3 inches and driven at a red heat when cut out must show no crystalline appearance.

STEEL AND IRON WORKMANSHIP.

All workmanship must be first class. All abutting sections, including the ends of all stiffeners for plate girders, but excepting their flanges when the cuts are fully spliced, must be milled or planed, to insure even bearings, taking like cuts to avoid injuring the fibers. All smooth-finished surfaces must be protected with white lead and tallow.

All abutting members must be brought into close and forcible contact, and when fitted to the spliced plates the rivet holes must be reamed to fit while in position at the shop, the plates being then marked so as to go in the same position when erecting.

Compression members when finished must be straight, out of wind, free from

kinks, buckles or open joints between the component pieces.

All measurements in laying out the work must be made with standards of the same material and at the same temperature as that of the members measured. These standards shall be compared with that used by the district surveyor in locating this substructure, and any allowances necessary for difference between them must be provided for at the time of laying out the work.

Rivets are to be made of the same material as that of the work riveted and of steel when the work is in part of both steel and iron. They must be machine-driven whenever possible; completely fill the holes, have full heads concentric with and at a hight not less than 0.6 of the diameter of the body and hold the parts together tightly by a forcible grip. Bolts shall not be used instead of rivets unless specially permitted; they must then be in double shear and turn to a tight fit for the hole.

Rivet holes to be punched in both wrought iron and soft steel, but not more than $\frac{1}{16}$ inch larger in diameter on the die side of the hole than that of the intended rivet. They must be carefully spaced and punched, and be clean-cut, without torn or ragged edges. Where they do not come accurately opposite they must be reamed to take the rivets without drifting, and the sharp edges at each extremity shall be removed.

Rollers, pins, and lateral bolts must be turned perfectly round and straight, and roller beds must be plain. Unless otherwise directed, all pins and bolts must have hexagonal heads and nuts.

All pin holes, including those of loop eyes, must be bored accurately and 90° to the axis of the members unless otherwise required by the drawings. In pieces not adjustable for length, no variation of more than $\frac{1}{64}$ inch will be allowed in the length between centers of pin holes. The diameter of pin holes shall not exceed that of the pins by more than $\frac{1}{32}$ inch, nor more than $\frac{1}{50}$ inch for pins under 3½ inches in diameter.

Eye-bars must be bored in the center of the eyes on the center line of the bars.

Whenever links are to be packed more than $\frac{1}{8}$ inch per foot of their length out of parallel with the axis of the structure they must be bent with a slight curve until the heads stand at 90° with the pins in their intended positions, before boring.

All links of the same panel when piled in their relative positions must allow the pin at each end to pass through at the same time without forcing.

No welds whatever will be allowed in steel work, and in iron work only in forming the loop eyes on hanger, lateral, counter and sway rods.

All screw threads to be United States standard, and the screw ends of the tie rod must in all cases be upset on the rod. Rods to be made adjustable by the use of sleeve nuts and clevises only.

Thimbles or washers of cast or wrought iron must be used to fill all vacant spaces on pins or bolts. Pilot and driving nuts must be provided where necessary to preserve the threads of pins intact during erection.

Where connection bolts pass through slotted plates with their heads or nuts in contact with the same (as at expansion joints) thin round washers must be provided to span the slots.

The Largest Wire Nail Machine.

To the Editor: The largest wire-nail making machine in the United States, described in your issue of September 8, 1892, built by M. M. Smith, of Greenpoint, N. Y., has been steadily in operation in the works of the Puget Sound Wire Nail and Steel Company, Everett, Wash., since its arrival early in July last. Would respectfully call the attention of your correspondent in *The Iron Age* of September 29th to the fact that this is *the largest wire nail machine in the United States*, as it makes 60 steel wire nails per minute 13½ inches long by ½ inch in diameter. I am, sir, yours very truly,

A. R. WHITNEY, JR.,
General Manager Puget Sound Wire Nail and Steel Co.

EVERETT, WASH., October 8, 1892.

Mahoning Valley Interests.

An excellent idea of the importance of the Mahoning Valley as the producer of raw and finished material is furnished by a recently issued statement showing the receipts and shipments of various materials by the manufacturing interests of that place. This statement was prepared by H. S. Evans, secretary of the Mahoning and Shenango Valley Iron Manufacturers' Association, and covers the 12 months ending on September 30, the table headed receipts showing the number of tons material received by the furnaces and by the rolling mills, while the table of shipments represents the material of various firms sent out of the valley by the blast furnaces and rolling mills. The statement is as follows:

Receipts.

	Rolling Mills. Gross tons.	Blast Furnaces. Gross tons.
Pig iron	165,300	.
Ore	57,450	783,500
Muck bar, plate and skelp iron	42,400	. . .
Billets and steel slabs	28,500	. . . . .
Scrap and old rails	77,230	. . . . .
Slack and coal	543,685	22,840
Fire brick and clay	11,211	. . . .
Sand	14,730	19,000
Coke	. . . . .	610,400
Cinder	. . . . .	55,325
Limestone	. . . . .	226,950
Total	940,506	1,716,015

Shipments.

Muck bars	13,500	. . . . .
Finished iron	278,900	.
Mill cinder	57,500	. . . . .
Pig iron	. . . . .	448,000
Total	349,900	448,000

We also learn that, with the exception of a comparatively small amount of native black band ores used by two furnaces, all the ore used by the Mahoning Valley in the manufacture of pig iron during the past year came from the Lake Superior region. It is claimed that about one-eighth of all the ore mined in the Lake Superior district is used by blast furnaces of the Mahoning Valley. Now that there are good prospects of a Bessemer steel plant being built and in operation within a year, shipments of Bessemer pig iron from the valley to Pittsburgh and other points will be materially decreased, as much of the Bessemer iron now being sent out of the valley to other points will be used in home consumption when the steel plant is put in operation. As we have already stated, this same condition will apply to shipments of Bessemer iron from the Shenango Valley, as the completion of the Bessemer plant of the Shenango Valley Steel Company will use up a very large amount of Bessemer pig iron that now finds its way to other markets, much of it going to Pittsburgh. It may also be noted in this connection that the pressure of Mahoning Valley furnacemen to dispose of their Bessemer iron, which has heretofore resulted in very keen competition being given Pittsburgh furnacemen, will be removed to a great extent. As is well known for some years past, many Pittsburgh consumers of Bessemer iron could place orders to better advantage in the Mahoning Valley than they could with Pittsburgh furnacemen, notwithstanding the fact that the rate from the Mahoning Valley has always been from 40 to 50 cents higher per ton than the rate from Pittsburgh furnaces to points of consumption.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., October 18, 1892.

The action of the Board of Ordnance and Fortification in deciding that the pneumatic disappearing gun carriage, after an official test, had come up to all the requirements of the Ordnance Bureau contracts, but determining that no more carriages shall be built, is likely to lead to some vigorous action on the part of Congress. It was the determination on the part of the ordnance branch of the service to keep this business within themselves, which led Congress to require that there should be one civilian member of the board.

The action of the board now in officially commending the pneumatic disappearing gun carriage, but cutting off any further manufacture of these necessary appliances of fortification equipment, will lead to Congress placing three civilian members on the board. The manufacturers of the successful carriage have been paid for their experimental construction the $48,000 allowed in the contract.

The decision not to build any more, but to await the construction of certain carriages on any models, is construed to mean that civilian inventors are to be excluded. This action will lead to action in Congress which will be likely to cause some interesting developments.

The Government will require $30,000,000 worth of gun carriages. The gun carriage proposed by the army is said to be an infringement on Beverley Kennon's elevating carriage by means of counterweights.

A paper has been prepared which will be submitted to Congress alleging that the Ordnance Bureau has opposed every advance made in ordnance, notably the use of percussion caps instead of the old flint, the use of breech instead of muzzle loading rifles, the use of Gatling, Hotchkiss Maxim machine guns, Colt's revolvers and Spencer repeating rifles, all the inventions of civilian experts.

It is also shown as a matter of history that on the recommendation of naval officers the Ericsson monitor was rejected and her orders to go to Hampton Roads were countermanded. The little craft, however, had passed Sandy Hook and could not be recalled. As every one knows, but for the timely presence of the monitor the "Merrimack," having destroyed the old wooden frigates, would have had the whole Chesapeake Bay, Norfolk Navy Yard and Washington at its mercy.

It is also stated on authenticated testimony that the Bureau of Ordnance having rejected the Spencer repeating rifles, a few Illinois politicians succeeded in persuading President Lincoln to accompany them to the park south of the Executive Mansion and fire one of these new contrivances. He was so much pleased with the results that he gave his personal order over the adverse action of the Ordnance Department that two Indiana regiments should be armed with them. These regiments, it was conceded, caused the defeat of Hood's army at the battle of Nashville.

It is evident that the civilian inventors are organizing for a lively contest when Congress meets.

It is also proposed by certain Republican members of Congress who believe in home manufactures and inventions to investigate the action of the Army Board of Ordnance in adopting the Jorgenson magazine rifle, a Danish invention, modified by the Ordnance Office for the army, to the exclusion of American inventions. This will make another interesting controversy when the Presidential elections are over and Congress settles down to legislative business.

OBITUARY.

GEORGE BARNES.

George Barnes, a leading business man of Syracuse, N. Y., died last week at the Fifth Avenue Hotel, New York, of pneumonia, contracted on the steamer coming from Europe, where he had been spending some time in the hope of recuperating his health. The deceased was born October 1, 1827, in Kent County, England, and came to this country in 1841, taking up his residence in Syracuse. He studied law, learned the mason's trade, served in different capacities as a railroad employee, and was finally appointed superintendent of the Utica & Syracuse Division of the New York Central Railroad at the age of 26 years. Later he became a member of the nursery firm of Barnes, Phelps & Putnam and a partner in the lumber firm of Cogswell & Barnes. Finally he purchased an interest in the firm of Sweet Bros. & Co., who had just organized a shop for the manufacture of mowing-machine knives at Syracuse. In 1864 the firm was reorganized and became Sweet, Barnes & Co., Mr. Barnes becoming manager with William A. Sweet. The new company met with success, and eventually Mr. Sweet purchased one half of the buildings and started the manufacture of steel, and the present Sweet Mfg. Company was formed. Mr. Barnes retained the other half of the works and formed the firm of George Barnes & Co. They were successful, and increased their business of manufacturing mowing-machine knives, this being at the time one of the three manufactories of the kind in the United States, the two others being located at Fitchburg, Mass., and Akron, Ohio, conducted by A. Whitman. In 1876 all three of these manufactories were merged under one head and called the Whitman & Barnes Mfg. Co., with Mr. Barnes at the head of the concern, which has remained the same up to the present time. Mr. Barnes had been president of the Trust and Deposit Company of Syracuse, and was one of the original incorporators of the Onondaga County Savings Bank, of which he was a trustee. He has been president of the State Bank, and was one of the trustees of the Onondaga Orphan Asylum and also a trustee of the Syracuse Chilled Plow Company. His health had been failing for some time, and he had traveled extensively abroad in an effort to regain it.

G. EDWARD KNIGHT.

G. Edward Knight died at his late residence, 820 North Broad street, Philadelphia, Sunday, October 16, aged 56 years. Mr. Knight came to Philadelphia in the year 1852. In the year 1856 he entered the hardware store of Dilworth, Branson & Co. and remained with that firm during their existence, continuing with their successors, Vance & Landis, until the year 1865, when he entered the hardware store of R. & W. C. Biddle, and later the Biddle Hardware Company, where he remained until the year 1884. During that year he and his brother Henry bought out the established firm of John G. Brenner, Son & Co., and conducted the business under the firm name of H. & G. E. Knight until 1886, when they connected themselves with the successors of the firm of Newlin & Yardley, the firm name being thenceforth Newlin, Knight & Co., as at present existing. He retired from the hardware business in 1887 to join his father-in-law and brother-in-law, W. W. Green and D. S. White, in successfully conducting the popular hotel, "The Traymore," at Atlantic City, N. J. Mr. Knight was well and favorably known, not only with the hardware trade in Philadelphia, but through the entire States of Pennsylvania and New Jersey, and for a number of years controlled a large trade in those two States. Notwithstanding the fact that during the past few years his connection with the hardware trade has been severed, his loss will be felt keenly by his many friends and associates.

HENRY B. TATHAM.

Henry B. Tatham, a member of the well-known lead manufacturing firm of Tatham & Bro. of New York and Philadelphia, died at his residence in the latter city on the 10th inst. at the age of 75 years. The deceased was born in Philadelphia, where he with his four brothers began the manufacture of lead products about the year 1840. For many years Mr. Tatham had taken a deep interest in municipal affairs, and gave freely of his time and means to bring about a better management of the city government. He was a prominent member of the Committee of One Hundred, and a constant attendant at St. Andrew's Protestant Episcopal Church. In his death Philadelphia loses one of her most prominent citizens.

Hello, Chicago!

The longest telephone line ever constructed, exceeding by at least 450 miles that in operation between Paris and Marseilles, was publicly tested on the 18th inst. The line extends between New York and Chicago, passing through Easton, Harrisburg, Altoona, Pittsburgh, New Castle, Youngstown, Cuyahoga Falls, Maumee and South Bend, to Chicago, branch lines leading from Cuyahoga Falls to Cleveland and from Maumee to Toledo. The line was opened by Mayor Grant of New York and Mayor Washburne of Chicago, who exchanged congratulations and assured each other of their distinguished considerations. At the offices of the builders of the line, the American Telegraph and Telephone Company, 18 Cortlandt street, New York, provision had been made for the visitors to practically test the line by the installation of some 40 receiving instruments. Ordinary conversation from Chicago was heard as distinctly as on the lines between New York and Brooklyn, the speaker talking in an ordinary tone of voice. An interesting incident connected with the opening was the talking from the New York end of Prof. Alexander Graham Bell, the inventor of the telephone, with Wm. H. Hubbard, who assisted Professor Bell in the installation of the first telephone line ever erected, at the Centennial Exposition in 1876, and with whom he had not conversed through a telephone since that time.

The line is constructed of No. 8 hard-drawn copper wire, weighing 435 pounds to the mile, the total length being 950 miles. It is strung upon poles, the utmost care, of course, being paid to insulation, and the use of cables has been avoided wherever possible. The two wires forming the circuit are run on what is called the balance principle—that is, the wire from New York passes on the north side for a short distance, then crosses to the south side, then back to the north side again, this arrangement being adopted in order to avoid induction.

The transmitting instrument was the ordinary long-distance telephone which is now being so extensively introduced. After the visitors had become satisfied and had individually tested, as far as they desired, the working of the circuit, they partook of a collation, and then inspected the various departments in the Telephone Building, which were fully explained by the courteous and well-informed employees of the company. Each guest received as a souvenir a spiral wire, each end of which was flattened and stamped with the words "Chicago" and "New York" respectively, and to each end of which was hung a miniature telephone. The line connects Chicago with New York and all the intermediate points, and it opens, practically, telephonic communication between all the New England and Middle States and the principal cities in Wisconsin, Michigan, Ohio, Indiana and Illinois.

The Meeting of the Finishers.

A meeting of finishers was held in Youngstown, Ohio, last Saturday evening, and the question of a separate organization distinct from the Amalgamated Association was discussed. There were delegates present from Pittsburgh, Leetonia, New Castle, Niles, Hubbard, Warren and Girard, and a large number of the representative finishers from the above places were in attendance, comprising rollers, heaters, heaters' helpers, roughers and catchers. The meeting was called to order, and Charles Kelley was made chairman and P. J. Conner secretary. The question that has been agitating the finishers for so long, that of forming a new organization, was thorougly discussed.

While the majority favored this plan, some of the delegates were not prepared to decide the matter definitely, and it was thought best to secure more general opinions before taking final action. The matter of selecting officers was also brought up, and the names of Wm. Martin of Pittsburgh and James H. Nutt of Youngstown were suggested for president, and George D. Gessaman named for secretary.

A committee of ten finishers, five from Pittsburgh and five from the valley, was appointed to look over the situation more carefully and report at the next meeting, and if advisable formulate plans. The place and date of next meeting was left in committee's hands. The idea is to have the new association, whose name was not discussed, in shape to deal direct with the manufacturers by July 1 next. The membership will consist of finishers exclusively. Some of the finishers oppose the project. It is said that the action of severing from the Amalgamated Association would not cripple it to any great extent, but would greatly complicate the matter of a scale settlement each year, and if demands were made by one or the other, the manufacturers could refuse to grant them; and if the finishers went out the puddle department could be continued, and if the puddlers went out, the finishers could be continued on steel billets instead of muck bar. The finishers backing this movement are leading workmen in the finishing departments of the districts represented, and they say that as the Amalgamated Association failed to take care of them this year, but forced a 10 per cent. reduction, they propose to care for themselves.

Extension of the Brooklyn Elevated Railroad.

Contracts have just been signed for two important extensions of the Brooklyn Elevated Railroad. One leads from the present terminus of the Fulton avenue line to Cypress Hill Cemetry, and calls for 4000 tons of steel; the other is the South Brooklyn extension from Thirty-eighth street and Fifth avenue, the present terminus, to Third avenue and Sixty-seventh street, with a shuttle line to the Thirty-ninth street ferry, and requires 6000 tons of steel. The contract for the Fulton avenue line was let to the Edge Moor Bridge Works of Wilmington, Del., and that for the other to Cofrode & Saylor of Philadelphia.

Valley News.

The Youngstown Bridge Company have been awarded the contract to erect a ten-span bridge for New Brunswick, N. J. Each span will be 164 feet long.

The Lloyd-Booth Company, Youngstown, Ohio, are making a guide mill for the Hammond Works, Hammond, Ind., also the new mills for the Brown-Bonnell Iron Company. Their Youngstown and Warren works ere running full time.

Hon. E. A. Wheeler, manager of the Wheeler Iron Company's two blast furnaces at West Middlesex, Pa., and one at Sharpsville, Pa., says that their plants will be in operation by January 1 next. The furnaces are being put in first-class shape in every particular.

The work on the new 10-inch pipe mill of P. M. Kimberly & Co.'s works at Greenville, Pa., is in progress and will, it is expected, be completed and ready to run in a few weeks. The Kimberly works are well supplied with orders, both at their Sharon and Greenville mills.

The Ohio Steel Company of Youngstown, Ohio, will in a few days break ground for their large steel works in that city. Julian Kennedy of Pittsburgh is looking after the construction of the plant. The city of Youngstown has excluded the tract of land where the Steel plant is to be built from the city limits, so as to reduce the taxes to the least minimum. The company will push the work of constructing the buildings through this fall and winter, and early next spring will be ready for machinery and full equipment, so as to start up the works next summer. All the trunk line railroads have made arrangements with the company to enter their plant over the Austintown and Youngstown bridge. The following roads will have access to the property: The Erie, the P. & L. E., the L. S. & M. S., the Penna Company, the P. P. & F., and the Baltimore & Ohio. The site for the new steel plant covers nearly 100 acres, half of which will be occupied by the plant which is to be put up this winter.

P. L. Kimberly, the well-known iron manufacturer of the Shenango Valley, has just returned from a trip to the Mesaba range, where he is interested in developing one of the richest iron ore mines in that region. A railroad track 80 miles in length is being laid from the region to the Lake Superior in order to facilitate shipments, and a number of steam shovels are now in operation lifting the ore from the bed, which is only a few feet from the surface. The product seems to be unlimited in quantity.

Summers Bros. Company, Struthers, Ohio, are making a great deal of Bessemer steel sheet, and the demand for this class of metal is brisk. The works are running in every department.

The Youngstown Steel Company are erecting one of the largest machine shops in this region at their Brier Hill plant. The building is 310 feet long by 70 feet wide and will be fitted with lathes and all modern appliances. The whole structure is made of brick and iron.

The Hammond Nail Works, at Hammond, Ind., which are owned by Youngstown capitalists, are making 1000 kegs of nails daily.

The electric street car business in the Mahoning and Shenango valleys is assuming large proportions. Lines are being built from Sharon to Sharpsville, from Youngstown to Girard, and one from Warren to Niles and Mineral Ridge. The Youngstown Street Railway Company are spreading their lines through the city in all directions, and in another year Youngstown will have as good street car facilities as most cities in the Union.

The Lloyd Booth Company, Youngstown, Ohio, which have been operating the Ætna plant in Warren for some time, have forwarded the necessary papers to Columbus for the incorporation of the Ætna Foundry & Machine Company, with a capital stock of $50 000, which will be distributed among the present stockholders of the Lloyd-Booth Company. J. W. Russell will manage the plant. The company have large contracts which will keep the works running for many months.

The Curtis Steel Roofing Company will manufacture iron and steel standing seam roofing, corrugated and V-crimp siding and weatherboard siding. They will make a specialty of the painting upon good goods, and intend to use graphite paint almost exclusively, and will put two coats upon each side of the sheets, guaranteeing the material against the necessity for repainting for a term of years. Their plant at Niles, Ohio, is fitted up in first-class shape, and ready to take care of a large business.

Wm. Tod & Co., Youngstown, Ohio, have a large order for drawing and straightening machinery from the Union Drawn Steel Company, Beaver Falls, Pa. They also have of similar work six drawing machines under construction for the Ellwood Shatting & Tube Company, Ellwood, Pa. They are also building a blowing tub, with their new improved air valves, for one of the furnace engines of the Union Iron Company of Buffalo, N. Y., which company are rebuilding their furnaces under the supervision of Julian Kennedy.

Frank H. Buhl, president of the Sharon Iron Company, has just concluded a deal whereby he assumes the stock of James V. Rose in the Sharon Clay Mfg. Company's works, near the Sharon Iron Company's plant at Sharon.

The Andrews & Hitchcock Iron Company of Youngstown, operating two blast furnaces at Hubbard, Ohio, are about to erect three large Kennedy hot-blast stoves. The contract has been awarded to Wm. McIntyre & Sons of Sharon.

The trouble at the Coleman, Shields & Co. mill at Niles was settled last Saturday. The whole difficulty at this plant, in common with the Mahoning Valley Mill of Youngstown, was in regard to the classification of the mill. The owners contended that the classification should be "plate," and the men refused to go back to work on that basis, claiming that the mill should run on the "jobbing" basis. The men have been out now nearly four months. Many conferences have been held. The manufacturers insisted that the mills would not start unless upon the plate mill classification. Last Thursday the local lodge at Niles granted the change in classification. Colonel Coleman of the Niles firm agreed to pay the average wages in any four mills the men might choose. It is expected that work will be resumed in another week. It is believed that the Valley Mill trouble will be settled on the same basis before the week closes.

The Anaconda to be Stopped.

The contemplated stoppage of the Anaconda group of copper mines mentioned in last week's *Iron Age* will eventuate on November 10. We have the best of authority for stating that mining operations will be suspended on that date for a period of three months. During the interim there will be a clean up of ore and flue dust and a general overhauling of equipment preparatory to a heavier production upon restarting. This, our informant states, will be increased to a degree that will round the year 1893 with as large an output as that of any previous year. The shut down was not designed to have any bearing on the copper market.

The census of Brooklyn made by the Health Department shows a total population of 970,046.

MANUFACTURING

Iron and Steel.

The Rosena Furnace Company of Pittsburgh have been granted a charter of incorporation with a capital stock of $1,000,000. The incorporators are Henry W., David B., Jas. B. and Jno. C. Oliver, and Chas. D. Fraser. The above-named persons constitute the Oliver Iron & Steel Company, who recently purchased Rosena Furnace, at New Castle, and have taken out a charter of incorporation as noted above.

The Bolton Iron & Steel Company of Pittsburgh have filed a notice with the authorities at Harrisburg, Pa., of a change of name to the Canton Steel Company.

The Girard Iron Company, operating Mattie Furnace at Girard, Ohio, last week put in operation a new blowing engine. This engine will develop 700 horse-power, and was built by the Southwark Foundry & Machine Company of Philadelphia, and is said to be the largest blowing engine in service in the Mahoning Valley.

A new building for shipping purposes is being added to the plant of the Ætna Iron & Steel Company at Bridgeport, Ohio. It is 40 x 80 feet in size, and is almost completed. After an idleness of about one year, the labor troubles at the billet and sheet-bar mills of this concern have been arranged, and these departments started up last week. The output of this concern is now very large, and in one day recently, on a 24-hour run, the 16-inch bar mill turned out 96 net tons of bars on a single train of rolls. During the month of September the total output of the concern was over 4000 tons. When it is known that this output consists almost exclusively of sheet iron and steel and small bars, some idea of the amount of work done may be formed.

The Muncie Rivet Company, Muncie, Ind., we are advised, has been reorganized under the name of the Boyce Rivet Company, James Boyce, president and treasurer; J. A. Weeks, vice-president and general manager; and Edward Boyce, secretary. They are now running the works, producing a complete line of genuine Norway rivets, especially adapted to the requirements of large manufacturing concerns, as well as the trade, and have up to the present met with the most gratifying success, with a very bright prospect for the future.

Mattie Furnace of the Girard Iron Company, at Girard, Ohio, has been making a splendid record since the present blast commenced, the average output for the months of August and September being 213 tons per day. A new blowing engine will be started up during the present week, and the above output will no doubt be considerably increased when this engine is put in operation. The entire output of this stack is used by A. M. Byers, wrought-iron pipe and tube manufacturers, at Pittsburgh.

The Eagle Iron & Steel Company of Ironton, Ohio, manufacturers of bar and sheet iron and steel, have just completed the erection of a new sheet mill, which was put in operation last week.

The Curtis Steel Roofing Company are a new concern engaged in the manufacture of roofing material, at Niles, Ohio. They have built a factory 60 x 40 feet, which will be enlarged according to its needs. The company will manufacture iron and steel standing-seam roofing, corrugated and V-crimp siding and weatherboard siding. They will make a specialty of the painting upon their goods, and intend to use graphite paint almost exclusively, and will put two coats upon each side of the sheets, guaranteeing the material against the necessity for repainting for a term of years, the time of such guarantee depending upon the situation of the buildings and their surroundings.

The North Carolina Steel & Iron Company, Greensboro, N. C., will build a rolling mill at Greensboro for making merchant bar iron.

On November 1 the properties of the Tennessee Coal, Iron & Railway Company will be placed in the hands of a Board of Control, consisting of Nat. Baxter, A. M. Shook, J. J. Hillman, J. H. Aldrich and H. F. De Bardeleben. The different offices will be consolidated at Birmingham, H. F. De Bardeleben being general financial manager; David Roberts, manager in charge of selling iron; J. H. Aldrich, manager in charge of selling coal, and G. B. McCormack, superintendent of mines.

The work of relining and remodeling the Philadelphia Furnace, at Florence, Ala., is being pushed and the furnace will go into blast as soon as the work is completed.

No. 2 City Furnace of the Sloss Iron & Steel Company, Birmingham, Ala., has been blown in after being thoroughly overhauled. It was

blown out June last, and during its idleness a new stove has been added and the foundations put in for a new 42 x 84 x 60 E. P. Allis blowing engine. The latter is expected every day, and will be put in place as soon as received.

Additional beds are being built outside of the cast house for the Dora Furnace at Pulaski, Va., which now has an average daily output of 130 tons of iron.

The new ore-washing plant for the Unaka Iron Company, at Unicoi City, Tenn., is nearly completed, and shipments of ore will be commenced at an early day.

The Philadelphia Furnace, at Florence, Ala., has completed its repairs and will go into blast, it is stated, at once.

The work of dismantling the furnace of the York Iron Company, at Black River Falls, previous to its removal to West Superior, Wis., is progressing rapidly. Ground has already been broken on the new site for railroad tracks and foundations. The company is planning to increase the capacity in the new construction to 100 tons per day.

On the 11th inst., after more than three months of idleness, owing to difficulty as to wages, the Delaware Rolling Mill of Phillipsburg, N. J., resumed operations under an agreement between the management and the employees of the mill. The rate paid for puddling will be $3.65 until bar iron reaches 2 cents per pound, when the rate will be advanced to $4.

The plant of the Eureka Iron and Steel Company, at Wyandotte, Mich., is being offered for sale by Sidney D. Miller of Detroit, Mich. The plant includes a charcoal blast furnace and a rolling mill.

The blast furnace of the Charlotte Iron Works, at Rochester, N. Y., has been relined and otherwise improved, and will resume operations after an idleness of two years.

Judgment has been entered against the Bristol Rolling Mill Company of Bristol, Pa., in favor of the Farmers' and Mechanics' National Bank of Bucks County, Pa. Other claims being urged, the mill suspended operations indefinitely. The works made cotton ties, rolled from piled scrap.

Two boilers in the rolling mill of the Burgess Steel and Iron Works, at Portsmouth, Ohio, recently exploded, killing two men outright, seriously injuring a number of others, and badly wrecking the building.

Crumwold Furnace, formerly known as the Emaus Furnace, at Emaus, Pa., will be put in blast as soon as possible, and preparations are now under way to get the stack in working order. The stack is 66 x 16 feet, and was first put in blast in 1872. It was rebuilt in 1880, and remodeled in 1890 and equipped with three 60 x 18 Gordon-Whitwell-Couper fire-brick stoves. The annual capacity is placed at 32,000 net tons. Robert H. Coleman of the Colebrook Furnaces, Lebanon, Pa., is trustee and lessee. The plant has been idle for a long time.

At the annual meeting of the stockholders of the Akron Iron Company, held at Akron, Ohio, last week, the old board of directors, consisting of Lewis Miller, Ferdinand Schumacher, Daniel Upson, E. B. Miller and R. A. Miller were re-elected. The directors organized by electing Lewis Miller president; J. A. Long, secretary; A. P. Baldwin, general superintendent, and E. B. Miller, assistant superintendent.

At a meeting of the Board of Directors of the Thomas Furnace Company held in Easton last week, John T. Knight was elected president to succeed the late Benjamin G. Clarke, and Samuel Drake was elected vice-president.

Last week a reduction of 2½ per cent. in the wages of the employees of the Crescent Steel Works at Pittsburgh went into effect. There was no discontent manifested by the workmen over the reduction, as it was in accordance with the scale agreed upon between the firm and their men some months since.

Machinery.

The Ætna Foundry & Machine Company, Warren, Ohio, has been incorporated with a capital stock of $50,000. The incorporators are H. K. Taylor, H. M Garlick, Lloyd Booth, C. H. Booth and C. W. Bray. A complete organization has not as yet been effected, but this will be done in a short time. This new concern succeeded to the business formerly carried on by the Ætna Machine Company, and which was purchased about six months ago by the Lloyd Booth Company of Youngstown, Ohio. It is the intention of the new concern to make large additions and improvements to the plant, and the output will consist of tin-plate and rolling-mill machinery, a specialty being made of the former class of product. J. W. Russell of Hubbard will be superintendent of the works.

Last week Wm. Tod & Co. of Youngstown, Ohio, received an order for a 750 horse-power Porter Hamilton engine from the Riverside Iron works, Wheeling, W.Va. This engine is to drive a 21-inch plate mill, and is a duplicate of one furnished by them to the Riverside Iron Works about three years ago. In addition to the above, Wm. Tod & Co. have recently received a large order for drawing and straightening machinery from the Union Drawn Steel Company of Beaver Falls, Pa. They also have six drawing machines under construction for the Ellwood Shafting and Tube Company, Ellwood, Pa. They are also building a blowing tub with new improved air valves for one of the furnace engines for the Union Iron Company, Buffalo, N. Y., which concern are erecting a blast furnace under supervision of Julian Kennedy, Pittsburgh, Pa.

The Maris Machine Company, Philadelphia, have sold out to and been succeeded by a new company under the style of Maris & Beekley, which will continue the business of manufacturing and building cranes of all descriptions, overhead tramways, teal portable hoists, trolleys, &c., at the above address. The members of the new firm are Frank Maris, Charles E. Maris and William M. Beekley, general partners, with Richard H. Chapman as special partner. The above reorganization has been made in consequence of a large increase in business, necessitating increase in facilities and capital. We learn that a very satisfactory success has been attained by the late company, and orders for cranes now on their books are sufficient to keep the shops actively employed until well on toward the end of the year. They have been run on double turn all summer, and are still so maintained. Maris & Beekley are now placing a number of new tools, including a radial drill, one heavy lathe and a traverse head shaper, and in every way improving their plant in order to bring it to the highest degree of efficiency. Among notable orders recently completed or at present in hand are a 15-ton power crane and a 5-ton hand crane, shipped on September 1 for New Orleans; two 8 ton jib cranes for the Pennsylvania Railroad, and a number of other cranes now under way for Baltimore, Springfield, Ind., Hazleton, Pa., &c. There is now being constructed in the firm's shops over 4000 feet of track, with trolleys, hoists, &c., for the Boston-Montana Copper and Silver Refining Company of Great Falls, Mont.

The Stark Machine and Tool Company of Buffalo, N. Y., are building a line of heavy power shears to cut as heavy as ¼-inch stock from 2 to 11 feet in length at a single cut with an under-running single gear, accomplishing this result by an equalizing lever to impart motion to the crosshead, so that the inertia in the balance wheel is evenly distributed throughout the entire stroke.

The Pennsylvania Machine Company of Philadelphia inform us that they are shipping this month from New York City by the Pacific Mail Steamship Company a 60 horse-power self-contained engine and a 60 horse-power horizontal tubular boiler of locomotive type, which have been ordered for a power plant to be used on a coffee plantation in Nicaragua, Central America.

Just at a time when it was thought to be definitely settled that the Fulton Iron Works of Hinckley, Spiers & Hayes of San Francisco were to be located at Oakland, Cal., and when ground was ready to be broken for the plant, the announcement is made by the company that they will not locate at that point, but will establish works at San Francisco. The people of Oakland had raised a bonus of $10,000, and the Oakland Water Front Company made a direct offer of $25,000 as an inducement to the company to locate works on their property, and the Board of Trade of Oakland had made every effort to bring about such an arrangement. Why they failed in this, and what caused the sudden change of mind on the part of the company, is not quite clear. The Oakland people charge the company with bad faith, while the company, claim that the title to the land on which the plant was to be erected was not clear and satisfactory, considerable litigation having recently taken place regarding it. It is generally understood that the new works will be located on the water-front adjoining Harbor View, San Francisco. The property is owned by Senator J. G. Fair, who is thought to have made a very tempting bid for the works at the proper time. The works were formerly located at San Francisco, but were so badly crippled by fire some time ago that a new plant was rendered necessary. They have since been incorporated as the Fulton Engineering and Shipbuilding Works, with a capital stock of $1,000,000, of which it is claimed $95,500 has already been subscribed. The new works will be much larger than the old, and will be constructed with special reference to shipbuilding, besides which a general foundry, machine and boiler business will be carried on. The directors of the new company are: Daniel B. Hinckley, Fruitvale; Daniel E. Hayes, Mill Valley; James Spiers, Berkeley; Frank A. Huntington, Oakland; Richard D. Chandler, San Francisco; L. C. Bresse, San Francisco; Henry P. Christie, San Francisco.

The new plant of Shea & Strahle, boiler manufacturers, Chattanooga, Tenn., which was recently destroyed by fire, is being rapidly rebuilt and it will be ready for occupancy next week.

The County Court at Lexington, Va., has appointed R. M. Witt receiver of the Rarig Machine Works of Buena Vista, Va.

The Pooser Machine Works, at Marietta, Ga., were destroyed by fire last week. The loss was about $5000, with $2000 insurance. The plant will be rebuilt at once.

Arrangements have been made by J. W. Smith, secretary and treasurer of the Hackney Hammer Company of Cleveland, Ohio, with Stevens, Hamilton & Co. of Galt, Ont., builders of machine tools, for the manufacture of Hackney hammers in Canada.

The Fulton Tool & Mfg. Company of Canal Fulton, Ohio, have found it necessary to enlarge their establishment, owing to the increase in their business. An additional building has been erected and equipped with improved machinery, doubling the capacity of the plant.

H. M. Sciple & Co., Third and Arch streets, Philadelphia, report an exceptionally large volume of business on hand just now in engines and boilers. They have recently concluded, or have at present in train, some large contracts, including the necessary power plant for the Brightwood Electric Street Railway, Washington, D. C.; one 600 horse-power engine and boiler for the Consolidated Street Railway & Light Company, Huntington, W. Va.; 400 horse-power boiler, and 500 horse-power heater for the electric railway at Shenandoah, Pa.; a large boiler plant of 400 horse-power for John Lang of Philadelphia, and 450 horse-power boiler, with a large stack 88 inches in diameter and 100 feet high, for the Fairmount Ice Mfg. Company, Philadelphia.

The new shops of the Susquehanna & Western Railroad, at North Paterson, N. J., are about completed, and comprise the machine shop, 220 x 81 feet; blacksmith shop, 90 x 51; tank shop, 63 x 30; engine house, 40 x 31, and a car repair and paint shop, 140 x 81 feet. All the buildings are of brick. They will be put in operation some time this month, with a force of about 400 men.

Noyes & Goddard's Foundry, at Waterville, Me., has been destroyed by fire, together with valuable patterns. The loss is $10,000.

The Piqua Forge & Machine Works of Piqua, Ohio, have made an assignment to C. B. Jamison.

Active building operations have been commenced on the large foundry which the Carnegie Steel Company, Limited, will erect at Braddock, Pa. Two main buildings will be erected, each 80 x 200 feet in size, and many hundreds of tons of structural iron will be used in the construction of the buildings.

At Pittsburgh, on Monday, the 17th inst., the courts granted an order allowing Alexander Thomas, assignee of James P. Witherow, engineer and contractor, to sell the plant of Mr. Witherow, located at New Castle, Pa., at private sale to the creditors. It is understood that the creditors have agreed to pay a fixed sum—said to be $125,000—for the plant, and also to assume about $100,000 in liens which have been filed against it. In all probability this plant will soon be transferred to the creditors by Mr. Thomas on the above conditions.

Thomas & Co. of Philadelphia have leased the Durrin Iron & Bell Foundry at North Wales, Pa., and will enlarge it for the manufacture of heavy iron work for building purposes.

The Hartman Foundry and Machine Works, at Grand Rapids, Mich., are nearly completed. They are larger and much more complete than the burned structure whose place they fill.

Clark, Churchill & Co. of Bloomington, Ill., may remove their works to Dubuque, Iowa, providing the inducements offered by the latter place are considered great enough. The company manufacture ice and refrigerating machines, steam pumps, automatic engines, &c.

Work will shortly begin at Spokane, Wash., on the erection of new car shops for the Great Northern Railroad.

The Florence Iron Works, at Florence, S. C., have been leased and will be operated by McLeod & Walsh.

The Ferracute Machine Company of Bridgeton, N. J., have just completed a new automatic coining press for the United States Mint. It can turn out 200 coins per minute.

Hardware.

The National Wringer & Mfg. Company, Canton, Ohio, are erecting a new factory to meet the increased demand for their goods. The main building will be 125 feet long by 42 feet wide, and will be used for finishing wringers. It will be three stories high. The rubber department for manufacturing rolls, bicycle tires, hose and other rubber specialties, will be one story high and 100 x 75 feet. The dimensions of the boiler and engine rooms are 40 x 60 feet. The buildings are to be ready for occupancy November 15, and are to be fitted up with the latest improved machinery. All the machinery for the rubber plant was purchased in Birmingham, Ala. The wringer factory will contain new machinery as follows: Six automatic drill presses, nine tapping machines, six engine lathes, fitted up especially for milling down shafts; three screw-cutting machines, besides several bench machines, emery wheels, &c. The company advise us that the cost of these improvements will be in the neighborhood of $18,000, and that the factory when completed will be an especially well-appointed one. They also state that they are some two months behind in their work, orders being now on their books for nearly 2000 dozen wringers.

In a recent issue of the *Illustrated Buffalo Express* views were given of the factories of the United Indurated Fiber Company, located at Lockport, N. Y., and Portland, Maine, with descriptions of the same. The plant at Lockport, it was stated, is 500 feet long by 50 feet deep, averaging three stories in hight, and the one at Portland is about the same size. At these two factories, which are operated day and night, about 300 workmen are employed, and about 1500 horse-power is required to carry on the business.

Hubbard & Co. of Pittsburgh, the great shovel manufacturers, have recently completed an important addition to their factory and their capacity is about doubled. They can now make 120,000 dozen shovels and scoops annually of the Antrim and Chisholm patterns.

We have already referred to the fact that the Eclipse Bicycle Company, formerly located at Indianapolis, Ind., would remove their plant to Beaver Falls, Pa. The concern will occupy the buildings formerly belonging to the Beaver Falls Cutlery Company, and which are said to be well adapted to their wants. The buildings are fitted throughout with piping for steam heat, natural gas, artificial gas and the Neracher sprinkler system. With the buildings are a number of steam and drop hammers, large and small power presses, shafting, lathes, drill presses, planers, &c., and the machinery of the entire plant driven by water wheels. There are three of these wheels, the smallest having a capacity of 150 horse-power. The size of the buildings are as follows: Front of main building 120 feet; length of wings, 200 feet each, and all having a width of 43 feet. In addition to these, main buildings which have a depth of 310 feet and width of 35 feet, giving in all a floor surface of nearly 100,000 feet, giving them the fifth largest bicycle plant in the United States. Already considerable of the machinery at Indianapolis has been removed to Beaver Falls, and in a short time the firm expects to commence the manufacture of bicycles for their 1893 trade in their new location. The removal will not cause any change in the management. H. H. Fulton, president of the Eclipse Bicycle Company, will remove to Beaver Falls to look after the manufacturing department of the business, while D. L. Whittier, secretary and treasurer, will remain in Indianapolis, where the principal office will be, to attend to the office work. E. K. Tryon, Jr., & Co. of Philadelphia will continue to represent the concern in the Eastern markets.

Insinger & Co. of Philadelphia have added largely to their workshops and increased their manufacturing facilities to nearly double their former capacity in order to meet a growing business. The Insinger Dish Washing Machine, which is one of the specialties of the firm, was illustrated in our pages soon after its introduction some months ago. Since that time it has, we learn, been improved and perfected, and has met with very gratifying success. Insinger & Co. have placed 20 of these machines in various buildings in New York City alone, including the Fifth Avenue, Windsor and Savoy Hotels, and have supplied them to similar establishments in all parts of the country as far as California, receiving many testimonials to their usefulness and efficiency.

The Improved Process Glue Company, Gloucester, Mass., New York office with Tower & Lyon, 95 Chambers street, are building an addition to their plant, and have contracted for boilers, engine and machinery which will increase their manufacturing capacity from 5 to 8 tons per day.

TRADE REPORT.

The past week has been quite eventful, and has, on the whole, developed very favorably for the Iron and Steel interests. It is becoming more and more evident that current consumption is enormous, greater by far than even the sanguine expected. The low prices so long prevailing are evidently aiding Iron and Steel to enter into many channels. The one conspicuous exception is the Rail trade, which is languishing, so far as orders are concerned.

Reports from the leading primary Pig-Iron markets are decidedly encouraging. While occasionally low prices do crop up, it is unquestionably true that sellers are in a better position than they have been at any time this year, and it is not impossible that a modest advance of 25¢ on Foundry and Forge grades may be secured at an early date.

Bessemer Pig in Pittsburgh is still selling as low as ever, but the feeling is better.

The Soft Steel trade has been aroused by quite a sensational advance in Pittsburgh, followed in a minor degree in the East. Spot Steel is scarce, and for future delivery the low prices so recently prevailing have been withdrawn. The consumption is obviously enormous, and promises to continue so, unless prices reach a figure which will either stimulate the Rail mills to become free sellers or lead to a return to Puddled Bars.

The Structural mills are filling up very rapidly with work, and the prospects are very good indeed. The records in low prices were broken in the letting of the Brooklyn Elevated work, of which 4000 tons was taken by the Edge Moor Bridge Co. and 6000 tons by Cofrode & Saylor. Chicago reports that the Metropolitan line will give out work soon, and it is regarded as very likely that the great Philadelphia contracts for elevated structure will also come into the market before the close of the year. Then there is a good deal of shipbuilding in sight, so that the mills are likely to be crowded this winter.

Chicago records a sharp advance in Beams, while in New York the report is current that 5000 tons of foreign Beams have been placed. The early resumption of full time at Homestead is likely to influence this department very considerably.

In the East the dullness of the car shops is adversely affecting Bar Iron. In the West the works are busy and prices are steady. The Merchant Steel mills are crowded with work.

The Sheet Iron and the Galvanized Iron trade is very active throughout the country, and prices display some advancing tendency.

Heavy sales of Cut Nails are reported from the West at $1.45 @ $1.50, while Wire Nails have been pushed by offerings down to $1.45 ₱ keg. The Barb Wire trade is dull.

The feature in the Metal market has been the advance in Copper, due to the decision to close down the Anaconda mine on November 10 for a period of three months. The mine is the greatest producer in the world, having a record of having made over 12,000,000 lb in a single month. Lead is drooping, while Spelter seems hopelessly mired. Tin Plates are quiet.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 18, 1892.

The market during a portion of the week was interrupted by the Columbus celebrations, but a full average business has been done nevertheless, and at this writing the outlook is decidedly encouraging. With one or two trifling exceptions, prices for everything on the list are strong, and anything like the demand calculated upon is pretty sure to develop higher prices. The change of feeling based on actual consumptive requirements is very pronounced, and although prices are something better than they were six months ago, there is a fair probability that still higher figures will rule before the year closes. With the demand increasing, and stocks decreasing, the conditions naturally favors higher prices. The special features are the probability of a better demand from the shipyards and for bridge and general structural work. Two or three 8000 to 10,000 ton steamships must be built within a year or a year and a half, in accordance with a contract entered into between the Postmaster-General and the International Navigation Company. In addition to this, contracts have just been taken by the Edge Moor Iron Company and Cofrode & Saylor for 10,000 tons of material for the Brooklyn Elevated Railway, and as other large concerns in the East are already crowded with orders, it may be regarded as absolutely certain that there will be an abundance of work during the winter months.

Pig Iron.—The market has not changed to any appreciable extent during the past few days, but in some quarters there is a disposition to claim a somewhat higher level of prices. This, however, is not confirmed by actual sales, although there is a degree of strength, which is very encouraging to holders. A large business could be done by shading prices a little, but as makers refuse concessions orders are mostly for small and medium-sized lots to cover immediate requirements. Buyers are compelled to pay about 50¢ advance (from the lowest figures) for deliveries during the balance of the year, and may have to pay that, or more, for the first quarter of next year, but they are not confident enough to do so at present. The general outcome of the week's business, therefore, has been to confirm the advance previously established and to impart additional strength in regard to the future, and while consumers for the present refuse to follow prices upward, there is certainly nothing in the situation that indicates weakness. The output of Pig Iron is likely to show further increase during the next few weeks, and although there has been quite a decrease in stocks, the supply will doubtless be pretty well in line with the demand. The ultimate course of prices, however, is contingent upon the amount of new business taken within the next few weeks, which, from present appearances, will probably be very large, and keep prices in seller's favor. Meanwhile sales continue to be made at prices as follows for Philadelphia delivery or its equivalent and for some Southern brands, 25¢ @ 40¢ less for South and Central Pennsylvania or Maryland:

American Scotch, No. 1x	$17.00	@	$17.50
American Scotch, No. 2x	16 00	@	16.50
Standard Penna. (Lake Ore), No. 1x	15.00	@	15.50
Standard Penna. (Lake Ore), No. 2x	14.25	@	14.50
Standard Penna. (Lake Ore), No. 2 plain	13.50	@	13.75
Medium Quality, No. 1x	14.25	@	14.50
Medium Quality, No. 2x	13.50	@	14.00
Standard Virginia, No. 1x	14.75	@	15.00
Standard Virginia, No. 2x	14.00	@	14.50
Virginia and Southern, No. 1x Soft	14.25	@	14.50

Virginia and Southern, No. 2x. Soft	13.50	@	13.75
Standard Penna. and Virginia Forge	13.25	@	13.50
Ordinary Forge	12.75	@	13.00
Hot-Blast Charcoal	17.00	@	19.00
Cold-Blast Charcoal	23.00	@	25.00

Bessemer and Low-Phosphorus Pig.—Business has not picked up to any great extent, although the movement in Finished Steel ought to be favorable to these interests. Meanwhile sales are made in a small way at $16 @ $16.25, and $17.50 @ $17.75 at furnace. Makers inclined to be very firm, and in some cases decline business at the inside figure.

Steel Billets.—The course of the market is very hard to follow, inasmuch as makers quote one price one day, and quite another price a day or two later, and to confuse matters still further, one concern may put their price up or down, as the case may be, at the very time when a competitor may be moving in precisely the opposite direction. Passing over these irregularities, however, there is no question that prices are at least 50¢ higher than they were a week ago. November and December deliveries have been placed at $24.75 @ $25 for Schuylkill Valley or equivalent points, and about $24.75 for January and February. October deliveries would command $26.25 @ $26 50, and for the first half of November, $25.75 @ $26 would be paid, if makers would close contracts today. The actual state of the case seems to be that the mills have not been able to catch up with the demand. In August it was supposed they would catch up in September, in September it was felt certain that they would catch up in October, but here in the last half of October the scarcity appears to be greater than ever, and it begins to be a question whether they will catch up at all during 1892, hence the irregularity in prices.

Steel Rails.—There is nothing of importance going on in this department. Mills are doing about the usual amount of business at prices as before, $30 f.o.b. cars at mills.

Bars.—A moderately good demand is reported, but nothing to appreciably influence prices. Car building is extremely dull, and mills find it hard work to get a full line of orders on their books. The general demand is good, however, but the orders are small and for quick delivery, so that with a fair degree of activity from day to day, there is nothing in hand to prevent immediate dullness just as soon as the demand slackens. Prices are steady, nevertheless, and for best refined Bars 1.67½¢ @ 1.75¢ is quoted for city deliveries, and 1.60¢ @ 1.65¢ at interior points.

Skelp.—Plenty of business could be had at a price—say something below 1.60¢, delivered, for Grooved; but as the mills are tolerably full of work, 1.60¢ @ 1.62½¢ is asked and obtained for small lots, early delivery.

Plates.—The demand for Plates is unusually large, so that manufacturers have no hesitation in quoting firm prices. Local concerns have a great deal of work in hand, and while desirous of securing a liberal amount for winter months, it is a question with some whether they ought not to ask an advance on figures recently ruling. As already mentioned, the Brooklyn Elevated Railway contract will require several thousand tons more, which with a very large amount of orders already on hand for bridges and buildings now in process of construction insures full employment for months to come, and may also lead to higher prices, although that will depend in some measure upon what Pittsburgh may be doing. Meanwhile, for lots delivered, prices are quoted about as follows.

	Iron.	Steel.
Tank Plates	1.85 @ 1.90¢	1.90 @ 2.00¢
Shell		2.20 @ 2.30¢
Flange	2.70 @ 2.90¢	2.50 @ 2.60¢
Fire Box	3.00 @ 4.00¢	2.70 @ 2.80¢
Special qualities		3.25 @ 3.75¢

Structural Material.—The mills are all full of work, and as there is still a continued influx of orders, it is difficult to meet the demand as promptly as desired. Prospects in this department are unusually favorable, and full work for the winter is secured beyond all question. Prices seem to be a little firmer, but quotations are nominally the same as last week—viz.: Angles or Sheared Plates, 1.95¢ @ 2¢, delivered; Universals, 2¢ @ 2.10¢, and Beams, Channels or Tees, 2.20¢ @ 2.30¢.

Sheets.—Business has been very active in this department, and stocks in first hands are in smaller compass than for years past. Prices are firm, but not quotable higher. Sales at prices about as follows:

Best Refined, Nos. 14 to 20	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26	3.15¢ @ 3 20¢
Best Refined, No. 27	3.30¢ @ 3.40¢
Best Refined, No. 28	3.40¢ @ 3 50¢

Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ½¢ lower than are here named:

Best Soft Steel, Nos. 14 to 20	3¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24	3¼¢ @ 3¾¢
Best Soft Steel, Nos. 25 to 26	3½¢ @ 3¾¢
Best Soft Steel, Nos. 27 to 28	3¾¢ @ 4¢

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	@ 70 %
Common, discount	@ 72½ %

Old Material.—There is a good demand for Steel, but other descriptions are rather slow sale. General quotations about as follows: Old Iron Rails, $19 @ $20, delivered; Old Street Rails, $20 @ $21; Old Steel Rails, $16 @ $17; No. 1 Railroad Scrap, $17 @ $17.50, Philadelphia, or for deliveries at mills in the interior, $17 @ $18, according to distance and quality; $11 @ $12 for No. 2 Light; $12 @ $13.50 for best Machinery Scrap; $12 @ $13 for Wrought Turnings; $8.50 for Cast Borings, and nominally $20 @ $22 for Old Fish Plates, and $14.50 @ $15 for Old Car Wheels.

Wrought-Iron Pipe.—Demand is much the same as last week, prices being a little better for prompt shipments. A large part of the manufacturing capacity remains idle, and it is unlikely that it will resume operations this year, unless some unforeseen demand arises. The base price for Wrought-Iron Pipe was changed on October 12 to the following rates: Butt, Black, 57½ %; Butt, Galvanized, 50 %; Lap, Black, 67½ %; Lap, Galvanized, 57½ %, with the usual dealers' and jobbers' commission. Boiler Tubes, 3 inches and larger, 67½ %.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 18, 1892.

The conditions have changed decidedly within the past week, especially with regard to Finished Iron and Steel. This is particularly noteworthy with regard to structural material. Prices have advanced sharply on Beams, and manufacturers are less inclined to take large orders for future delivery, preferring to confine their attention to getting out the contracts now secured. In other lines mills are refusing business for the first time for two years. Better feeling is apparent in every direction, except Wire Nails and Barb Wire.

Pig Iron.—Dealers report a very fair demand for Coke Iron; local brands have sold more freely the past week than for a week or two previous. Trade has not been up to the expectations for October, but this was ascribed to the firmness with which manufacturers insisted on maintaining their prices. A slight disturbance is just now apparent, owing to the effort made by one of the local companies to sell a quantity of Iron on which one of their customers had defaulted. But the amount is not large, and the circumstance is hardly considered more than a temporary episode. Consumers, however, are using it for all it is worth in endeavoring to break prices. From present appearances they will not be able to do this, and the more business held back now the more active will purchasing be in a very short time. Consumption here is heavier than ever before known and stocks are certainly being reduced at the furnaces. A prominent representative of the trade has just returned from a Southern trip and reports stocks well cleaned up among the heavy manufacturers. Companies which have put some of their Iron in storage yards are now being obliged to take it out again to supply their customers. The quantity held on storage account is reported to be only about 70,000 tons, notwithstanding the statement current that a great deal of Iron had recently been placed in the storage company's hands. The situation has greatly improved with respect to Southern Iron, and there is little fear now of the market breaking in that direction. Some considerable sales of Lake Superior Charcoal have been made since last report, and that class of Iron is held very firmly, as several of the leading makers refuse to quote below $17 on orders of any size. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal	$16.50	@	$17.00
Local Coke Foundry, No. 1	13.75	@	14.25
Local Coke Foundry, No. 2	13.50	@	14.00
Local Coke Foundry, No. 3	13.25	@	13.75
Local Scotch	14.25	@	14.75
Ohio Strong Softeners	16.25	@	17.00
Southern Coke, No. 1	14.75	@	15.25
Southern Coke, No. 2	13.75	@	14.00
Southern Coke, No. 3	13.25	@	13.75
Southern, No. 1, Soft	13.75	@	14.00
Southern, No. 2, Soft	13.25	@	13.75
Southern Gray Forge	12.50	@	13.00
Southern Mottled	12.50	@	12.75
Tennessee Charcoal, No. 1	17.50	@	18.00
Alabama Car Wheel	19.50	@	20.50
Coke Bessemer	15.50	@	16.00
Hocking Valley, No. 1	17.00	@	17.50
Jackson County Silvery	17.00	@	17.50

Bars.—The demand is good and prices are very steady. The mills which have been quoting 1.60¢, Chicago, have had no trouble in getting all the business they cared to take at that price, and quotations are now quite firm on a basis of 1.65¢ @ 1.70¢, Chicago, half extras. Jobbers' stocks are badly broken and their prices are firm at 1.85¢ @ 1.95¢, some establishments making 1.90¢ their minimum. Soft Steel Bars are quoted at 1.75¢ @ 1.80¢, Chicago, with few of the manufacturers anxious for business, being well filled up on time contracts. Jobbers quote 1.90¢ @ 2¢ on this class of material from stock.

Structural Iron.—The Beam market has changed very considerably within the past week. Instead of low prices now being named for future business the mills have been so well filled with work that they are only inclined to take small orders, and the leading makers positively refuse future business except at a sharp advance on present rates. Orders for 200 to 300 tons have been taken at 2.45¢ @ 2.50¢, Chicago. The change in the situation is believed to be owing to the fact that a very large manufacturer has been obliged to place orders with other mills, in order to meet the pressing demand of those having contracts. The fitting shops are still crowded with work for the balance of the year, and prospects are excellent for further large business. The Metropolitan Elevated Railroad are getting into shape to begin the erection of their superstructure and it is expected that they will soon ask for bids on several miles of track.

Angles are quoted at 2¢ @ 2.25¢, Chicago, for mill shipments; Universal Plates, 2¢ @ 2.20¢, and sheared plates, 2¢ @ 2.10¢.

Plates.—A large volume of business is in progress from store and from mill. Deliveries now being better from mill, the store trade is not quite so large as it has been. Jobbers report their stocks considerably run down, which will require several months to restore to their usual condition. Representatives of the Plate mills report a great deal of business in sight, which they are not able to handle, as prompt delivery is required. Prices on mill shipments are reported to be about as follows: Tank Steel 2¢ @ 2.10¢; Shell Steel, 2.15¢ @ 2.25¢; Flange Steel, 2.30¢ @ 2.40¢. Quotations from stock are as follows: Tank Steel, 2.30¢ @ 2.50¢; Shell Steel, 2.60¢ @ 2.75¢; Flange Steel, 2.75¢ @ 3¢; Iron Sheets, Nos. 10 to 14 gauge, 2.45¢ @ 2.60¢; Steel Sheets, Nos. 10 to 14 gauge, 2.50¢ @ 2.75¢. Boiler Tubes are firm at 67½ % discount.

Sheets.—Inquiries for Black Sheets are still abundant, and difficulty is experienced in finding mills in condition to take contracts for reasonably early delivery. No. 27 Common is quoted at 3¢ @ 3.05¢, Chicago, for mill shipments. A heavy trade is also in progress in Galvanized Iron, with stocks here very badly broken. Some manufacturers continue to quote 70 and 5 % discount for large orders on Juniata, while others state that their bottom price is 70 %. Jobbers have marked their quotations up to 65 and 10 % for less than 25 bundles.

Merchant Steel.—One of the largest mills in the country is now refusing to take any further business in a general way, which is said to be the first time in its history that this has occurred. Other manufacturers are crowded with work, and belated consumers are finding it difficult to get their orders considered. Open-Hearth Machinery and Spring Steel are quoted at 2¢ @ 2.20¢, Chicago, for carload lots, and Tire Steel 1.90¢ @ 2¢. Tool Steel is in very good demand at 6.25¢ @ 6.50¢ and upward, according to quality.

Billets and Rods.—Transactions in Billets are confined to moderate lots, with an occasional order for a few hundred tons. Prices are firm at $24.50, Chicago. Wire Rods are still scarce and firm. They are quoted at $34.50, but the local manufacturers are sold up for the remainder of the year, so that this quotation is only nominal.

Rails and Track Supplies.—New business in Steel Rails is still small and inquiries for next year are as yet only in prospect. Prices are maintained at $31@ $32.50, according to quantity. A moderate demand is reported for Splice Bars, which are firm at 1.70¢ @ 1.75¢. Track Bolts have been in a little better demand, with hexagon nuts quoted at 2.60¢ @ 2.70¢. Spikes are selling at 2.05¢ @ 2.10¢.

Old Rails.—A sale of 500 tons of Old Iron Rails was made last week at $18.30 to a dealer. The immediate supply is said to be controlled by a combination of dealers. Consumers are not inclined to pay the prices which are now asked, but the dealers are firmly of the opinion that consumers will be obliged to come to their terms ultimately. A different view, of course, is entertained by the consumers, who think that from the displacement of Iron by Steel the demand for Old Rails will be less than it has been, and will cause them to decline rather than to advance. Old Steel Rails are nominally quoted at $12.50 @ $14.25, according to length. Car Wheels are quiet, and are quoted at $14.50 @ $15, according to quantity.

Scrap.—While the demand for Scrap has not been very large the past week, dealers evidently have more courage in the future of the business and are taking all the Scrap, at good prices, which is now being offered by railroads. Quotations unchanged, as follows: No. 1 Railroad, $16 @ $16.50; No. 1 Forge, $15 @ $15.50; No. 1 Mill, $11; Pipes and Tubes, $10; Horseshoes, $16 @ $16.50; Sheet Iron, &c., $6; Cast Borings, $5.75; Wrought Turnings, $8; Axle Turnings, $9.50 @ $10; Machinery Cast, $11.50 @ $12; Stove Plate, $9; Malleable Cast, $10; Car Axles, $18.50 @ $19; Fish Plates, $17.25; Mixed Steel, gross ton, $10.50 @ $11; Coil Steel, $15; Leaf, $16.50, and Tires, $15.

Metals.—The Copper market is very firm and advancing. Lake Copper went up ¼¢ on Monday from Saturday, and still higher prices are looked for. Dealers are advising their customers to buy. They now quote carload lots of Lake at 12.25¢ and less than carloads at 12.50¢. Casting Copper is firm at 10.85¢ in carload lots, and also shows signs of advancing. Manufactured Copper does not share in strength of the raw material, Sheets now being sold freely at one-third off the list. Spelter continues to be quoted at 4.40¢ for carload lots of prime brands. Of Pig Lead, this week's circular of the Post-Boynton-Strong Company says: "The position of the metal is peculiar, to say the least, and unprecedented in the history of the Lead trade. 1, a falling off in the production; 2, an increase in the consumption; 3, no stocks held by refiners or speculators; 4, very limited stocks held by consumers, and yet the lowest price since 1889. It is always the unexpected that occurs, but at the same time it is a wise man who can tell what Lead is going to do. At this center values have held their own at 3.80¢, and sales of some 1200 tons have been recorded. We notice a growing inquiry for spot and future delivery, but at the same time a feeling of hesitancy on the part of producers to market many futures. We call the market at the close 3.77½¢ @ 3.80¢.

Rogers, Brown & Merwin of Chicago announce that they have been appointed sales agents for the Tennessee Coal, Iron & Railroad Company's Pig Iron, taking effect October 1. The company named operate the well-known Ensley, Sewanee and South Pittsburgh plants, covering four furnaces in Alabama and four in Tennessee, the output of which is about 250,000 tons per annum.

Louisville.

LOUISVILLE, KY., October 17, 1892.

Pig Iron.—The market is undoubtedly strong; consumers no longer expect concessions to be made. Furnaces are rapidly booking orders at full prices, and several transactions have been made for extended deliveries of Gray Forge at the last advance to $8.75, Birmingham. There is no disposition, however, notwithstanding the strong demand on the part of furnaces, to advance prices save where forced to by the heavy inroads on stocks held, as it is not felt wise to increase the prices beyond any point that they will not be able to maintain and the conditions of the market justify. It is believed that a steady improvement from now on will be manifest, and that no longer will purchasers of Iron find before the completion of contract that the same quality can be bought for less money, as has been frequently the case in the last two years. There are among the furnace men some who feel so strongly encouraged that they believe that before a decline again takes place we shall see a great increase in prices, the same steadily improving during the next two years. There is a good demand for Iron from all sections West at current prices. No. 1 Foundry is being held at basis of $11 furnace; No. 2 Foundry at $9.50 to $9.75 for extended deliveries; Gray Forge strong at $8.75. The present heavy buying West with increase in price checks the amount going to portions of the East temporarily, as Virginia furnaces are now offering for less money than Southern makers will accept. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry	$13.50	@	$14.00
Southern Coke, No. 2 Foundry	12.00	@	12.50
Southern Coke, No. 3 Foundry	11.50	@	12.00
Southern Coke, Gray Forge	11.25	@	11.75
Southern Charcoal, No. 1 Foundry	15.00	@	16.00
Southern Car Wheel	18.00	@	19.00

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, October 18, 1892.

The situation in the Iron and Steel trades this week shows but little change over that noted in our report of last week. The demand for all kinds of finished materials continues active, although much of the business now being booked is for delivery next year. Without question the event of the week was the very sharp advance in the price of Steel Billets for balance of the year delivery. Within one week Billets have shown an actual advance of not less than $1.50 @ $2 ₱ ton, and the advance bids fair to be sustained. Reference is made more fully to this feature of the market elsewhere in this report. The long struggle at the Homestead Steel Works is fast drawing to a close, and the desperate efforts made by the Amalgamated Association to compel the Carnegie Steel Company, Limited, to recognize that organization have been made in vain. On Monday, the 17th inst., a large number of the strikers made application for their old positions, and were given employment. Other and larger breaks in the ranks of the strikers are expected during this week.

Pig Iron.—While no visible advance in the price of Pig Iron has taken place, a considerably stronger feeling has developed within the last week or ten days, especially for Iron for spot delivery. A good demand is going for both Bessemer and Gray Forge, and liberal sales of the former were made during the week under review on a basis of $13.75, f.o.b. cars Pittsburgh. The activity prevalent in the Soft-Steel market has not been without its effect on Bessemer Iron, and this, in connection with the very favorable report of the reduction in stocks of Iron in September, has given the market a very much better tone than it has had for some time. In conversation with a large Pig-Iron maker the other day he expressed the belief that the turning point in Pig Iron is in sight, and if the present favorable conditions which surround the market can be continued for some time yet, an advance in prices is bound to follow. As showing the rapid manner in which stocks at some furnaces have been reduced, we cite the case of a concern in this district that 60 days ago had about 35,000 tons of Bessemer Iron piled up. In that time every ton of this Iron has been sold, and the furnace in question has all its product sold up for some time to come. We quote the market as follows:

Neutral Gray Forge	$12.50	@	$12.75,	cash.
All-Ore Mill	12.50	@	12.75,	"
No. 1 Foundry	14.00	@	14.25,	"
No. 2 Foundry	13.00	@	13.25,	"
Charcoal Foundry No. 1	19.50	@	20.00,	"
Charcoal Foundry No. 2	19.00	@	19.50,	"
Bessemer Iron	13.65	@	13.80,	"

While we quote Bessemer Iron as low as $13.65, we doubt if any Pittsburgh furnaces would sell at this price. However, a few concerns outside of this district con-

tinue to shade $13.75 to some extent, where points of delivery and payments are favorable. We note a sale of 4000 tons of Bessemer, equal deliveries in November and December, at $13.75, f.o.b. cars Pittsburgh, 1000 tons for same deliveries at $13.70 and 3500 tons for December and January delivery at $13.75, f.o.b. Pittsburgh.

Soft-Steel Billets.—The week under review will be remembered for some time by those in the trade as witnessing a very material and unlooked for advance in the price of Billets. By referring to our report of last week, it will be found that a number of sales of Billets for balance of the year and early next year delivery were reported as having been made by Pittsburgh and Wheeling on a basis of $21.85, f.o.b. at mill. While these sales were at a very low figure, it is intimated very strongly that that was not the lowest point reached, but reports are going of sales as low as $21.50, f.o.b. maker's mill, Pittsburgh. However, within one week the scene has undergone a wonderful change, and it is doubtful if these prices could be duplicated within $1 ₱ ton. It has been known for some time that some large buyers of Billets were holding off orders with the expectation of prices going down, and were buying only as their immediate wants required. The drop in the price of Billets two weeks ago brought a number of these buyers into the market, and as a result prices went up very rapidly, especially for Steel for this year delivery. In addition to this, it is known absolutely that every mill in Pittsburgh is well fixed with business, and the same condition of affairs prevails largely with concerns in the Wheeling district. As showing the great scarcity of Steel, we are advised that a dealer having an order for 500 or 600 tons for October delivery corresponded with every Soft Steel concern in this city and at other points, and was unable to buy it at any price, although as high as $24.25 at maker's mill had been offered, as against sales running into next year at less than $22, Pittsburgh. We are advised by one maker in this vicinity that he has booked within the last few days orders aggregating about 10,000 tons for shipment extending into March of next year at a price said to be $22.50 at maker's mill. Predictions are freely made on all sides that Steel for delivery this year will touch $25 in the near future, although, of course, this is only a prediction. We quote Steel for October delivery at $24 @ $24.50, but with very little available for deliveries running into next year it is absolutely impossible at this time to name quotations. One buyer advises us that he attempted to place an order aggregating a large amount on a basis of $22, f.o.b. cars Pittsburgh, and it was declined. Important developments regarding the Soft-Steel trade will undoubtedly be forthcoming during the present week.

Ferromanganese.—We continue to report a very firm market, with considerable material selling. The only producer of Ferromanganese in this district advises us that prices are firm at $62 @ $62 50. We note a sale of 400 tons at $62, f.o.b. at maker's furnace.

Structural Material.—The active demand for Beams and Channels noted for several weeks past continues, and as a result the recent advance in prices is being firmly maintained. One large maker in this city advises us that there are good prospects for the present active demand continuing for some time, owing to the fact that builders are willing to run the risk of having an open winter, thereby permitting outside building operations. We are also advised that a further advance in prices in the near future is not improbable. We quote Beams and Channels at 2.05¢ @ 2.10¢ for desirable orders, while for small lots a slight advance over these prices is obtained. Universal Mill Plates, Steel, we quote at 1.75¢ @ 1.80¢; Angles, 1 80¢ @ 1 90¢; Tees, 2.40¢ @ 2.50¢; Z Bars, 2¢ @ 2.10¢.

Muck Bars.—The demand continues heavy and makers advise us that it is almost impossible to fill orders as fast as they are being received. Some difficulty is still experienced in securing prompt shipments, and where makers are in position to furnish Muck Bars promptly they have no trouble in securing outside prices quoted. We quote No. 1 Muck Bars at $24.62½ @ $25, and note a sale of 1000 tons at first-named price, f. o. b. cars, Pittsburgh.

Skelp Iron.—There continues a large demand, and as far as we are advised, every mill in this city rolling Skelp Iron is very comfortably fixed with business. Some two or three concerns state that they have enough orders booked to run them well up to the close of the year. Not at any time for some months have the makers of Skelp Iron been as busy as they are at present, and as they have been for the past two or three months. We quote Grooved Skelp Iron at 1.60¢ @ 1.65¢, and Sheared at 1.80¢ @ 1.85¢, 4 months or 2 % off for cash.

Steel Rails.—The situation is unchanged and there has not been any improvement in the amount of new business being received. We are advised that some mills will probably finish up their Rail orders within the next 30 days, and may then go on Billets. Prices are unchanged at $30 for standard sections, f.o.b. at mill.

Steel Plates.—An active demand continues and considerable new business is in sight. As we have before remarked, Pittsburgh makers of Steel Plates have considerable difficulty in retaining customers, owing to the sharp competition from Eastern makers. This, of course, results in prices being made very attractive. Where large orders are involved prices have not shown any change within the past week, and we repeat our quotations of last week as follows: Flange, 2¢ @ 2.25¢, according to the time of delivery; Fire-Box, 3.50¢ @ 3.75¢; Tank, 1.75¢ @ 2¢; Shell, 2¢ @ 2.25¢; Bridge Plates, 2¢ @ 2.15¢.

Merchant Steel.—As a rule makers of this class of material report that business is in very satisfactory condition, but continue to state that where large orders are involved prices are shaded until there is a very small margin of profit left. Howe, Brown & Co., one of the largest makers of Merchant Steel in the country, have recently added to their equipment, thereby considerably increasing their capacity. These additions, we understand, were made principally in the Crucible department. The season is now at hand when buyers of Agricultural Steel will commence to figure on placing contracts, and considerable business of this nature is expected to be closed within the next 30 or 60 days. Prices are about the same as noted last week, and we quote as follows: Open-Hearth Spring, 2¢ @ 2.25¢; Tire, 2¢ @ 2.10¢; Toe Calk, 2.20¢ @ 2.35¢. We quote Tool Steel from 6¢ up, according to grade.

Wire Rods.—A moderate amount of business is being done, and one concern in this city advise us that they have enough orders booked to take their entire output for the balance of October and all of November. Reports are still going that the Beaver Falls mills of the Carnegie Steel Company, Limited, will be put in operation at an early date, although these reports have not been substantiated by the firm, as no official statement of their intentions regarding the Beaver Falls mills has yet been made by the owners. We quote Rods at $31 @ $31.50, and note a sale of 100 tons at $31.50, f.o.b. at maker's mill.

Merchant Bars.—As intimated in our report of several weeks since, there is a movement on foot among the finishers in the Amalgamated Association to leave that body and form an organization of their own. On Saturday night, the 15th inst., a meeting of rollers, heaters, roughers and shearmen, to the number of about 200, employed in the Mahoning and Shenango Valley mills, and also a few from the Pittsburgh mills, was held at Youngstown, Ohio. It is stated that the men are practically a unit on the question of a new organization, and it was decided to organize what will be known as the Finishers' Union. Committees were appointed on permanent organization, and to attend to other matters and report at a meeting to be held at an early date. Under date of the 18th inst., we are advised that the trouble at the mill of the Coleman, Shields Company, at Niles, Ohio, over the refusal of the men to class the jobbing mill as a plate mill has been settled, the men agreeing to return to work on the original proposition made by the firm. At the Elba Iron Works of this city, operated by the Oil Well Supply Company, good progress is being made in operating the plant with non union men, and we are advised that at this writing every department is running single turn. The firm expect in a short time to have sufficient men to operate the plant to its utmost capacity. The demand for Finished Bars continues very satisfactory, much of the business now being booked, however, being for late delivery. Where prompt shipments are desired, good prices are still obtained. We quote No. 1 Bars for early shipment at 1.65¢ @ 1.75¢, according to conditions. For later shipments, No. 1 Bars may be quoted at 1.57½¢ @ 1.65¢ Old Rail and Scrap Bars for early delivery are being sold at 1.60¢ @ 1.65¢, while for late delivery 1.50¢ @ 1.55¢ would probably be accepted. The demand for Sheets is very heavy and prices are firmly maintained. At no time this year have mills making Sheets been as busy or had as much business booked as at the present time. No. 24 Sheet may be quoted at 2.80¢, while No. 26 is 10¢ higher and No. 27 20¢ higher. For shipments later in the year these prices would be shaded to some extent. A large buyer of Sheets informs us that he was compelled to pay 3$\frac{1}{10}$¢ for two carloads of No. 27 Sheets in order to secure guarantee of shipment before navigation closes.

Barb Wire.—There is very little business moving, although, as noted last week, the extreme low prices are attracting orders to some extent, and more business is being placed just now for this reason than would otherwise be the case. It is not unlikely that buyers of Wire for spring delivery may come into the market a little earlier this year than usual, on account of the very low prices now ruling. We quote Painted Barb Wire at $2.05 @ $2.10 in carload lots, and Galvanized at $2.40 @ $2.50, also in carload lots. For smaller lots makers state they are able to secure slightly better prices than those quoted above.

Wrought-Iron Pipe.—A meeting of the Wrought Iron Pipe and Tube Manufacturers' Association was held in the Monongahela House, Pittsburgh, on Wednesday, the 12th inst. Out of 21 members in the association, 17 were present, Campbell N. Herron acting as chairman, and Jos. Brown, secretary. Reports from members present showed that there was considerable activity prevailing in the Pipe and Tube business, and several concerns stated that they were fully booked up with business

for the balance of the year, and were compelled in several cases to decline orders where prompt shipment was wanted. Notwithstanding the fact that there is a large amount of business going, and prices for Skelp Iron have advanced considerably, no advance in prices of Pipes and Tubes has taken place, but on the contrary, it was decided at the above meeting to make a reduction of 2½ % straight through on the list of discounts. Much dissatisfaction exists among makers on account of low prices, but it is understood that the severe competition offered by some members prevents any advance in prices being made. The new list of discounts went into effect on the day of the meeting, and is as follows: Black, Butt Weld, 57½ and 10 %; Lap Weld, 67½ and 10 %; Galvanized, Butt Weld, 50 and 10 %; Lap, 60 and 10 %. It is stated that a strong determination will be made to strictly maintain these discounts.

Cut and Wire Nails.—The very low prices ruling for some time for Cut Nails has largely stimulated the demand, and within the past week or ten days some very large contracts have been placed. Advices are to the effect that large buyers in the Northwest have placed orders calling for as high as 30,000 kegs, and from this amount down to 10,000 kegs. It is stated that, taken as a whole, the contracts placed will aggregate 100,000 kegs or over. Very little if any of this business will come to Pittsburgh, while Cleveland is reported to have taken considerable of it. The two concerns in this city making Wire Nails are both understood to be well fixed with orders, and one of them is said to have enough business booked to take their entire output for the balance of the year. We quote the market for Wire Nails at $1.50 in round lots, while in carload lots and less $1.55 is obtained. We are advised, however, that some large blocks recently placed were taken at $1.45, f.o.b. cars at Pittsburgh. In the Cut Nails trade there is very little of interest to note. A fairly large demand is going, and mills are very busy, principally on orders booked some time since. A number of concerns are considerably behind with shipments and are refusing to book any more orders until they have filled what they have already taken. We quote Cut Nails at $1.50 for nearby delivery in carload lots in Wheeling district; for large blocks and late in the year delivery, this price would probably be shaded from 2½¢ to 5¢ ℔ keg.

(*By Telegraph.*)

The heavy advance in Bessemer Billets which has taken place within one week is being firmly maintained. Nearly all mills report they are sold up for the balance of the year, and some into next year. An inquiry sent to Wheeling for a small lot of Billets brought a reply from the concern that they were sold up until April 1, with the exception of a few hundred tons in December, for which their price was $23.50 at mill. Small sales have been made in lots ranging from 300 to 1000 tons at $23.50. One dealer in this city has asked $25 for a large block of Steel for the balance of the year delivery, and confidently expects to get the order. This remarkable advance in prices is a complete surprise to everybody, and predictions are freely made of $25 Steel for this year's delivery within 30 days. We note a sale of 5000 tons of Bessemer Pig, equal deliveries from November to March inclusive, at $13.75, f.o.b. cars, Pittsburgh.

The office of Horace G. Dravo, sales agent for the Youngstown Steel Company and the Brier Hill Iron & Coal Company of Youngstown, Ohio, has removed from 421 Wood street, Pittsburgh, Pa., to Room 701, National Bank of Commerce Building, corner of Sixth avenue and Wood street, in that city. Wm. L. Abbott, formerly chairman of Carnegie, Phipps & Co., Limited, also makes his headquarters in the room occupied by Mr. Dravo.

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., under date of October 17, write: Business for the past week has been more active, and some transactions of considerable magnitude have been made. Buying is not confined to any particular quality, but Southern Iron is most called for, and prices on some special brands have been advanced, and others will not accept deliveries beyond January 1 except at higher figures. In several instances buyers who declined to purchase two weeks ago are now anxious to take the Iron at prices previously quoted. The large falling off in stocks has helped make buyers realize that bottom has been reached, and higher prices are reasonably certain to rule before the first of the year. The close of navigation being so near at hand, the buyers of Lake Superior Charcoal for shipment by water are hastening to purchase any odd lots they may require. The general market is firmer, and we repeat our quotations:

Lake Superior Charcoal, all numbers	$16.50 @ $17.50
Lake Superior Coke, Bessemer	16.00 @ 16.50
Lake Superior Coke Foundry, all ore	16.00 @ 17.00
Standard Ohio Blackband (40 per cent.)	16.50 @ 17.00
Southern No. 1	14.50 @ 15.00
Southern Gray Forge	12.50 @ 13.00
Jackson County (Ohio) Silvery	17.75 @ 18.25

St. Louis.

Office of *The Iron Age*,
Bank of Commerce Building,
ST. LOUIS, October 17, 1892.

Pig Iron.—The improvement noted in our last issue continues to gain strength daily, and during the past week the market has been treated to a dose of revivalism which it has not experienced during the present year. The decrease in production has much to do with the improved condition of the market, and indications point to a steady demand, which is now needed to hold the market in its present shape. The demand during the week under review has been of an excellent character, sales running from 200 tons up to 1000 tons for prompt delivery. Southern furnacemen do not appear anxious to sell too far ahead at to day's prices, but are keeping a portion of their output in reserve, so as to be in shape to take advantage of any further increase in values. Consumers are now more disposed to negotiate with a view to buying than they were three weeks ago, but while the movement has not as yet become general, it is still of sufficient importance to keep prices in a firm condition. Gray Forge is held at $8.75, which might be shaded a trifle, but it is doubtful if $8.50 would purchase even a good round lot. No. 1 and No. 2 Foundry are held at $10.75 and $9.50 respectively. Local manufacturers are all busy, while some are running double turn, and are consequently getting to the bottom of their iron supplies. These concerns will shortly want Iron, and will soon enter the market as buyers. The outlook is generally speaking of an improved character, and with a steady demand the prices quoted to-day will doubtless be maintained, and the possibility of an advance is considerably improved. For ordinary quantities we quote as follows, for cash, f.o.b., St. Louis:

Southern Coke, No. 1 Foundry	$14 00 @ $14.25
Southern Coke, No. 2 Foundry	13.00 @ 13.25
Southern Coke, No. 3 Foundry	12 25 @ 12.50
Gray Forge	12 00 @ 12.25
Southern Charcoal, No. 1 Foundry	15.00 @ 15.25
Southern Charcoal, No. 2 Foundry	14.50 @ 14.75
Missouri Charcoal, No. 1 Foundry	14.25 @ 14.50
Missouri Charcoal, No. 2 Foundry	13.75 @ 14.25
Ohio Softeners	16.25 @ 16.75

Bar Iron.—The demand continues to hold up in good shape. Mills are kept busy and prices are firmly adhered to. Present indications point to a continuance of the present demand well into the new year, but prices are not expected to improve any. At the moment we quote as follows: Lots from mill, 1.65¢, half rates f.o.b. cars East St. Louis. Jobbers quote 1.80¢ @ 1.85¢, according to quantity.

Barb Wire.—The demand for Barb Wire does not improve to any extent whatever. The fall trade is pretty well over, and although the unusuallly fine weather prevailing throughout the West has enabled farmers to do more outdoor work than they are generally able to do at this season of the year, the effect has not been perceptible on the demand for Barb Wire. Prices are unchanged as follows: Mills quote $2.20 for Painted, and $2.65 for Galvanized.

Wire Nails.—The remarks made with reference to Barb Wire apply also to Wire Nails. The demand is light and prices are weak. Local mills quote $1.65 @ $1.70, f.o.b. St. Louis, which seems to be bottom at this writing.

(*By Telegraph.*)

Pig Lead.—The demand has been exceedingly light, at from 3 70¢ @ 3.75¢. Inquiries are numerous for October Lead, but there does not seem to be much offering. November and December Lead is freely offered at 3.75¢. A slightly higher market may prevail before the end of the month.

Spelter.—Sales have been confined to car lots for immediate shipment. The market is much firmer, at from 4.10¢ @ 4.15¢, and at the latter price some few sales have been made. Stocks continue to accumulate, however, and any material advance in prices seems out of the question.

Cleveland.

CLEVELAND, OHIO, October 17, 1892.

Iron Ore.—Among the sales reported for the past week have been a considerable quantity of non-Bessemer Specular and Magnetic Ores, assaying 65 % in Iron, at $4 ℔ ton f.o.b vessels Lower Lake ports; a few thousand tons of hard Bessemer Ores, 62 % in Iron and below 0.06 % in phosphorus, at $4, and some small lots of non-Bessemer at $3, same conditions. The sales for the past three or four days will probably aggregate 75,000 tons, including about 35,000 tons of Hematites and a liberal quantity of non-Bessemer Specular Ores. It is evident that a large amount of Ore will be sold before December 1, and the buying movement inaugurated so auspiciously the past week is likely to be kept in motion for some time to come. The fight over vessel rates is interesting. Shippers, by persistent effort, have kept the rate from Escanaba down to 80¢, while $1.05 is paid from Marquette, and $1.25 from Ashland and Two Harbors. Receipts of new Ore are falling off a bit, but are still ahead of those for the same weeks in 1891. Last week 39,000 tons were unloaded on the local docks as compared with 38,500 tons for the corresponding week in October last year. The demand from the furnaces is also a trifle heavier, 37,000 tons having been sent along during the past seven days as against 30,000 tons for the previous week.

Following are the present quotations:

No. 1 Specular and Magnetic Ores, Bessemers	$4.85 @ $5.25
No. 1 Specular and Magnetic Ores, Non-Bessemers	4.00 @ 4.25
Hematite Ores, Bessemers	4.00 @ 4.25
Hematite Ores, Non-Bessemers	3.00 @ 3.35

Several fairly large transactions in Hematites are reported to day at $4 ℔ ton, and a few thousand tons of Non-Bessemers have been placed at about $3 ℔ ton, f.o.b. vessels Cleveland.

Pig Iron.—A firmer feeling prevails, and there exist some really good reasons for believing that the market will soon improve in every way. Stock piles have been materially reduced since September 1, and are gradually growing smaller. Only a few sales and these of no particular importance are reported, but dealers talk seriously of higher prices at a very early day. Quotations given out to day are as follows:

Nos. 1 to 6 Lake Superior Charcoal	$16.50 @ $17.00
Nos. 1, 2 and 3 Bessemer, per ton	14.00 @ 14.25
No. 1 Strong Foundry, per ton	14.25 @ 14.50
No. 2 Strong Foundry, per ton	13.25 @ 13.50
No. 1 American Scotch, per ton	14.50 @ 14.75
No. 2 American Scotch, per ton	13.75 @ 14.10
No. 1 Soft Silvery, per ton	15.00 @ 15.50
Mahoning and Shenango Valley Neutral Mill Irons, per ton	13.00 @ 13.25
Mahoning and Shenango Valley Red Short Mills, per ton	13.25 @ 13.50

Nails.—Local dealers quote both Wire and Cut Nails at $1.65 ℔ keg in stock. The mills are actively engaged upon old orders.

Barb Wire.—The mills are crowded with work, although prices are not very encouraging. Something better is looked for, however, as the demand is excellent.

Old Rails.—The demand is only fair, and Old Americans are not hard to obtain at $19 ℔ ton.

Scrap.—The market continues to improve so far as the volume of business is concerned. No. 1 Railroad Wrought is quoted at $15 @ $15.50; Cast Scrap at $12 @ $12.50, and Wrought Turnings at $8 @ $8.50.

Bars.—The demand is fair and Common Bar is quoted at 1.65¢ @ 1.70¢.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, October 19, 1892.

The general tone of the Iron market has become more confident during the week, and while it seems to be impossible to obtain any advance in prices for round lots, there is less talk of concessions, and sales of Gray Forge are more readily effected at $8.50, f.o.b. Birmingham. Mottled Coke Iron has sold at $8.25, but the offerings are light at this price. Foundry Irons have sold to a moderate extent at previous prices, but there is more inquiry for nearly all kinds of Iron for delivery running four months into next year, but buyers do not want to pay any advance, while sellers ask 25¢ and even 50¢ ℔ ton more. It is noteworthy that nearly all consumers are disposed to have deliveries made on outstanding contracts promptly or in advance of requirements, which is in strong contrast to their action for several months past. There is evidently a large consumption in progress, and the movement of Pig Iron is liberal in all branches of the manufacturing trade, and apparently in excess of production by the furnaces. It is therefore only natural that we should find material inroads upon stock, as has been done during the first half of this month. There have been numerous sales the past two weeks, but the largest was only 2000 tons. While the aggregate was not large it was of liberal proportions, and would have been greater if some sellers had not withdrawn entirely from the market. Quotations are as follows:

Foundry.

Southern Coke, No. 1	$13.25 @ $13.50
Southern Coke, No. 2	12.25 @ 12.50
Southern Coke, No. 3	11.75 @ 12.00
Ohio Soft Stone Coal, No. 1	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2	15.00 @ 15.50
Mahoning and Shenango Valley	16.50 @ 17.25
Hanging Rock Charcoal, No. 1	19.75 @ 20.00
Hanging Rock Charcoal, No. 2	19.00 @ 19.50
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00

Forge.

Gray Forge	11.25 @ 11.50
Mottled Neutral Coke	11.00 @ 11.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	18.75 @ 19.00
Lake Superior Car Wheel and Malleable	17.75 @ 18.00

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, October 19, 1892.

Pig Iron.—Agents and merchants do not report any marked movement in this market, and the only feature of interest is the fact that Southern furnace companies show less anxiety to sell and have withdrawn the lowest prices made during the past few months. Indeed it is intimated that they will at an early date mark up their figures an additional 25¢ ℔ ton. From Buffalo comes the report of a very low price on Nos. 6 and 7 and of Lake Superior Charcoal, $15.25 being the figure named. We quote Northern brands at $15 @ $15.50 for No. 1; $14 @ $14.50 for No. 2; $13 @ $13.50 for Gray Forge, tidewater. Southern Iron, same delivery, $14.50 @ $15 for No. 1; $13.50 @ $14 for No. 2 and No. 1 Soft; $13 @ $13.50 for No. 2 Soft; $12.50 @ $13 for Gray Forge.

Ferromanganese.—There is a more active demand, and consumers show a disposition to make efforts to contract for a supply for the first months of 1893. Sellers, however, are unwilling to enter into engagements of this character. We quote 80 % Ferro $60 @ $60.50. Spiegeleisen is nominally $26 @ $27.

Billets and Rods.—It is reported that a mill in eastern Pennsylvania has purchased 10,000 tons in Pittsburgh, declining to avail itself of an option on about 7500 tons with an Eastern mill. Foreign Rods are quiet at $40.50 @ $41. Domestic Rods may be quoted $33.50 @ $33.75, tidewater; Billets, $24.50 @ $25; foreign Billets, $30 @ $30.50, and Swedish Rods, $54.50 @ $56.

Steel Rails.—The market remains exceedingly dull at $30 at Eastern mills.

Manufactured Iron and Steel.—The event of the week has been the placing of the Brooklyn Elevated Railroad contract of 10,000 tons, 4000 tons of which have gone to the Edge Moor Bridge Works and 6000 tons to Cofrode & Saylor. We understand that the bids of the eight concerns which named prices all fluctuated between 3¢ and 3 10¢, erected, prices which are the lowest on record. The Eastern Structural mills are now all very full of work for months to come. Every one of them has some large work under way, and more is coming out. Among the large buildings which will soon be in the market is the Appraiser's Stores in this city, to be let toward the close of this month. In Beams, the most interesting news of the week is the report that one importer has placed about 5000 tons of German Beams recently. It is surmised that 20 inch Steel Beams must have largely entered into these orders, since they have been relatively scarce for some time past. It is estimated that foreign Beams can be laid down at 2.20¢ @ 2.25¢. An interesting transaction closed this week has been the sale of 5000 tons of Hoops at private terms. The shops using Tank Plates in this section are very dull. We note some export orders for Boiler Plates. We quote Beams, 2.35¢ @ 2.75¢ for small lots and 2.20¢ @ 2.50¢ for round lots, according to sizes; Angles, 1.95¢ @ 2¢; Sheared Plates, 1.85¢ @ 2.10¢; Tees, 2.30¢ @ 2.75¢; Channels, 2.25¢ @ 2.50¢, on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.9¢ @ 2¢ for Tank; 2.20¢ @ 2.25¢ for Shell; 2.50¢ @ 2.65¢ for Flange; 2.6¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Refined Bars are 1.67½¢ @ 1.9¢, on dock; Common, 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.95¢ @ 2.10¢, delivered. Steel Axles, 1.95¢ @ 2.1¢, and Links and Pins, 2¢ @ 2.20¢; Steel Hoops, 1.90¢ @ 2¢, delivered; Cotton Ties, 85¢ @ 90¢, at mill.

Track Material.—We quote Spikes, 1.90¢ @ 2¢; Fish Plates, 1.60¢ @ 1.65¢; Track Bolts, square nuts, 2.40¢ @ 2.60¢, and hexagon nuts, 2.70¢ @ 2.80¢, delivered.

Metal Market.

Copper.—Lake Superior Ingot has been sold to a fairly liberal extent at 11⅝¢ @ 11¾¢. The latter price was subsequently bid, while few lots, if any, could be secured at less than 11⅞¢ @ 12¢. Electrolytic has moved along with Lake Ingot, reaching 11⅛¢ @ 11¼¢ on actual sale. Casting brands have sympathized, and, after some sales at 10¼¢ @ 10⅝¢, are held at 10¾¢ @ 10¼¢, as to size and lot. *Bona fide* transactions have doubtless helped along the upward movement of prices in a certain measure, but evidences are not wanting of something strongly suggestive of speculation in certain quarters, and a tendency to make the most of sensational features. In the latter connection it may be noted that widespread circulation has been given the rumor that the Anaconda mines will be shut down on about November 10 for a period of three months, possibly for six months. The statement is also going the rounds that the leading lake companies will ship no Copper after the close of navigation except on orders, and that consumers who do not place orders in advance may be inconvenienced. Back of this come intimations that deals are working in the market for copper mine shares, and that more or less maneuvering is going on with a view to helping operations in that line. In other words, there is a broad insinuation of stock jobbing, in which some handlers of the metal are deeply interested. Nothing is said about production of Electrolytic Copper in quarters where Lead smelting is the chief industry.

Pig Tin.—Speculative dealings in Straits Tin involve a total of about 200 tons, chiefly for October and November delivery. Sales were made as high as 20.90¢ and as low as 20.65¢, net cash. There was nothing decidedly new in the character of the trading or in the surrounding influences. In short, it is the same old game manipulated by the same old dealer and his assistants. Whether prices are moved up or down would appear to depend almost wholly upon the standing of outside "long" or "short" interest in the market. The relation of supply and demand carries little weight. Purchases for jobbing account and consumption have been of fair average volume and chiefly at prices in line with those dictated by the speculative interest.

Pig Lead.—Prices have reached a still lower level. Carload lots have been sold at 4¢ and larger quantities at 3.95¢, for near future delivery. Certain speculative interests have accumulated a fairly liberal quantity of Lead at prices averaging slightly more than 4¢ ℔ lb here, but the fresh surplus offering seems to be more

than they, or rather speculators, are inclined to grapple with. Hence, it is now almost solely a question of contest between producers and consumers. The latter are well organized for defensive and other purposes. The producers are turning out more metal than is required and are not organized. In view of the above facts, it is not surprising that Lead at 4¢ is not looked upon now as being a bargain to the extent that it was a few months ago.

Spelter.—Western brands are more freely offered at 4.40¢ delivered in the East, and some have been sold at 4¼¢ delivered in Pittsburgh. At present there seems to be no foreign outlet at above the parity of 4.10¢ here, and, according to same advices, European operators do not regard the metal as a remarkably safe investment at that price. Hence home outlet has necessarily to be depended upon to absorb an unprecedented production, and the inevitable—a weak, irregular market—is the consequence.

Antimony.—Business has been fair, and, with supplies under better control, prices show some hardening. Current quotations are 10⅝¢ @ 10¾¢ for Hallet's, 11¢ for LX, 11¼¢ for Crown and 11½¢ @ 11¾¢ for Cookson's in round lots.

Tin Plate.—A routine spot trade of fair proportions, along with occasional orders for lots for shipment, covers about all there is to report on Foreign Plates. Supplies on spot are fairly well controlled, and, with assortments broken, prices for some varieties are rather higher. In American 20 x 28 Ternes there is some business here at $10.75 @ $14, as to brand and size of lot. We quote as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., $5.37½; Bessemer do., $5 30 for full weight; $5.15 for 100 lb, $5.05 for 95-lb, $4.80 for 90-lb Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.60 @ $5.65; Siemens Steel, IC basis, $5.75; IX basis, $6.80 @ $6.85. IC Charcoals—Melyn grade, ½ x assortment, $6.40; Crosses, $8; Allaway grade, any assortment, $5.70; Crosses, $7.20; Grange grade, any assortment, $5.80; Crosses, $7.25. Charcoal Ternes—Worcester, 14 x 20, $5.70; do., 20 x 28, $11.40; M. F., 14 x 20, $8; do., 20 x 28, $15.75; Dean, 14 x 20, $5.45; do., 20 x 28, scarce; D. R. D. grade, 14 x 20, $5.35; do., 20 x 28, $10.65; Alyn, 14 x 20, $5.40; do., 20 x 28, $10.70; Dyffryn, 14 x 20, $5.65; do., 20 x 28, $11.10. Wasters—S. T. P. grade, 14 x 20, $5.10; do., 20 x 28, $10; Abercarne grade, 14 x 20, $5; do., 20 x 28, $9.80.

The *Local News*, published at Homestead, Pa., which all along has been looked upon as the official organ of the Advisory Committee, and at the same time has advocated very strongly the cause of the striking workmen, in its issue of last week printed an editorial concerning the strike at Homestead, of which the following is a copy: "The Homestead situation to-day is a peculiar one. On one hand the spectacle is presented of over 2000 workmen in the mill, among whom are about 200 of the former Homestead employees. A number of skilled workmen from Braddock, Duquesne, Pittsburgh and other places are among the non-union workmen. The non-union workmen now live in and about the works and within the borough of Homestead. Nobody denies these facts If they do they are blind. That the company have won is admitted by many business men and citizens, large numbers of mechanics, prominent Amalgamated men and certain members of the Advisory Board. These admissions are as a rule confidential, but none the less true. On the other hand, the spectacle is presented of between two and three thousand idle workmen walking the streets of Homestead, keeping up the expectation that sooner or later they will win the strike. The only result the strikers can show is that they are keeping themselves well in line and are causing the steel firm loss and trouble. The candid observer can come to the following conclusions only: 1. The Carnegie Steel Company are gradually succeeding. 2. The great Homestead strike is dying out."

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, October 19, 1892.

Scotch Iron warrants have ruled somewhat lower, selling down to 41/5, with but little subsequent reaction. Cleveland warrants have moved in the same direction, with business as low as 88/3, and Hematite receded to 48/6 on limited dealings. At the decline there has been rather more business, since makers' stocks, according to current report, are low, while the amount of Iron in public stores continues to steadily diminish. Connal's stores have now about 367,000 tons, and the quantity of Cleveland Iron there has been reduced 468 tons during the past week. However, consumers are purchasing only as immediate wants demand, and that fact, along with moderate shipping business, tends to check operations on outside account.

Operations in Pig Tin have continued on a quite liberal scale, and, under the influence of good purchases for America and the Continent, local trading served to carry prices up to £95. 7/6. From that point some reaction has been caused by realizations, but there is no pressure, and the undertone appears to be quite strong for the time being. Shipments from the Straits during the first half of the month were 1230 tons. Spot stock on the 15th inst., 2279 tons.

The market for Copper is momentarily flat. Prices for merchant Bars, prompt delivery, were carried to £46. 2/6 under the influence of reports that the Anaconda mines would be closed down during November and statistics showing a decrease of 1772 tons in the European visible supply during the first half of the month. Subsequently, however, a reaction took place under sales to realize and some movement on "bear" account in which Rio Tinto interests were understood to have been interested. Purchases for consumption have been on a broader scale during the week.

Business in Tin Plate has been quiet and the Swansea market is easier. Business at the quarterly meeting was meager, prices offered not meeting makers' views. Uncertainty regarding the Presidential election in America also retards business. Business has been chiefly in Ternes and Bessemer Cokes, the latter at 11/6. Stocks at shipping ports, 146,000 boxes, against 113,000 boxes at the corresponding period last year.

Cleveland Pig.—The market rather slow and prices unsettled, with sellers at 38/6 @ 38/9, f.o.b. shipping port, for No. 3 Middlesborough.

Scotch Pig Iron.—Business has been quiet, but prices for nearly all brands are very firmly held.

No. 1 Coltness,	f.o.b.	Glasgow	55/
No. 1 Summerlee,	"	"	54/
No. 1 Gartsherrie,	"	"	52/
No. 1 Langloan,	"	"	53 6
No. 1 Carnbroe,	"	"	44 6
No. 1 Shotts	"	at Leith	52 6
No. 1 Glengarnock,	"	Ardrossan	50/
No. 1 Dalmellington,	"	"	49/
No. 1 Eglinton,	"	"	47/

Steamer freights, Glasgow to New York, 1; Liverpool to New York, 7/6.

Bessemer Pig.—Under the influence of weakness in warrants makers have reduced their price to 49/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—Business moderate, but former prices adhered to. English 80 % quoted at £11. 11/3, f.o.b. shipping port.

Steel Rails.—The demand has been slow and prices are barely steady. Heavy sections quoted at £4. 2/6, f.o.b. shipping port.

Steel Billets.—A moderate business doing and the demand still moderate. Bessemer, 2½ x 2½ inches, quoted at £4. 2/6, f.o.b. shipping point.

Steel Blooms.—Market remains very quiet and without change. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Steel Slabs.—Sales light, and chiefly at old prices. Bessemer quoted at £4., f.o.b. at shipping point.

Old Iron Rails.—Demand very fair, and prices steady. Tees quoted at £2. 15/ and Double Heads at £2. 16/3 @ £2. 18/9, f.o.b.

Scrap Iron.—Prices unchanged, but the market a shade firmer, with demand fair. Heavy Wrought Iron quoted at £2. 5/ @ £2. 7/6, f.o.b.

Crop Ends.—The market quiet and without change. Bessemer quoted at £2. 10/ @ £2. 12/6, f.o.b.

Manufactured Iron.—Outside of routine business nothing doing and the business chiefly at old prices. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ordinary Marked Bars	8	5	0	@	.....		
" Common "	6	7	6	@	6	10	0
Staff. Bl'k Sheet, singles....	7	5	0	@	.....		
Welsh Bars (f.o.b. Wales)....	5	7	6	@	5	10	0

Tin Plate.—Liverpool market slow and prices about as before but barely steady. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	13/6 @ 14/
IC Bessemer Steel, Coke finish	12/ @ 12/3
IC Siemens " " "	12/3 @ 12/6
IC Coke, B. V. grade 14 x 20	12/ @ 12/3
Charcoal Terne, Dean grade	11 9 @ 12/

Pig Tin.—The market steady at the close and moderately active, with Straits quoted at £95 for spot and £95. 10/ for three months' futures.

Copper.—Market closes quite firm, but business is less active. Merchant Bars quoted at £45. 15/, spot, and £46. 5/, three months' futures. Best selected, £50. 10/.

Lead.—There has been but little business, and prices are easy at £10. 7/6 for Soft Spanish.

Spelter.—The market remains quiet but fairly firm, with £18. 17/6 quoted for ordinary Silesian.

HARDWARE.

Condition of Business.

THE WEEK which has elapsed since our last report is a broken one, the Columbian celebration interfering considerably with the regular course of business. The effect of the national holiday this week will also be felt. The reports from manufacturers and the trade at large indicate an excellent volume of business, with perhaps a falling off in the demand upon jobbing houses, as the trade are now experiencing something of the lull which usually comes between the early and the later fall demand. The tone of the market is without change. Large quantities of goods are constantly going into consumption, and the aggregate of trade certainly compares well with other years. In a good many lines manufacturers are crowded with orders to such an extent that the trade experiences some inconvenience owing to delayed shipments. The changes in price are comparatively few and unimportant. In some of the staples the market is a shade weaker than it has been and low quotations are ruling for such lines as Wire Nails, Wire, Chain and other goods which lie near the raw material. The condition of business in the leading centers is reflected in the following reports, which are deserving of careful perusal:

St. Louis.

(By Telegraph.)

Shelf Hardware continues in good demand. Heavy Hardware is freely called for, and orders for general assortments of Hardware are becoming more numerous. The warm spell which has prevailed in this locality during the past ten days has caused a let-up in the demand for Stoves and Stove Trimmings, but with the return of cold weather this department will again be active. Wire and Cut Nails and Barb Wire are dull at unchanged prices. Fire Arms, Ammunition, Axes and Hatchets are all in good demand. Prices are well maintained, and collections are good.

Chicago.

(By Telegraph.)

While some of the jobbing houses report a very fair trade still in progress, others have experienced a falling off. The very warm weather of the past week may have had some influence on the demand for winter goods, as Stove dealers say that they have felt its effects very decidedly. The masses of the people do not buy goods unless they are compelled to, and a cold snap is needed to make them feel that winter is really coming. Builder's Hardware, such as Locks, Bolts, Hinges, Screws, &c., constitutes a very large part of the business now being done. House-Furnishing Goods are also moving quite freely. Nails are in stronger demand, but in small lots, showing that dealers are only taking them as fast as their necessities compel them. Heavy Hardware holds up remarkably well, which is mainly owing to the continued demand for iron and steel from manufacturing consumers, who cannot get deliveries promptly from the rolling mills. Collections are very good.

Baltimore.

CARLIN & FULTON.—There is but little in the business situation at present worthy of remark. The heaviest portion of the fall trade is over, and we do not expect to see many more buyers, at least from the South, in our city this season; and from now on trade will depend very much on orders per mail and the success of the traveling salesmen.

R. G. Dun & Co.'s report of the greatly reduced number and less importance of failures throughout the country this year, as compared with a year ago, is most gratifying and corroborates what we have stated heretofore, that the condition of the average merchant throughout the country is as good financially to-day as it ever has been, and the quiet state of trade which has prevailed throughout the cotton section is an evidence of its conservatism and intention to do no business rather than incur indebtedness not easily discharged.

From all that we can hear, purchases for the present will be confined mostly to goods strictly seasonable and for immediate wants, but all the tendencies point toward a brisk demand for goods after the excitement of the elections shall have passed and the country settled down to work.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—There is not much news to offer concerning the wholesale Hardware trade of Omaha. Business continues very large in a general way, and fully up to expectations. The continued warm weather has necessarily checked the demand somewhat for Stoves and kindred goods. This is only a postponement, however, as the first cold snap that develops will instantly infuse a rush at its first appearance. Collections keep up in a very regular manner, indicating that the retail trade of the country is in a satisfactory condition financially. It is certain that Nebraska has a good corn crop, and with anything like a fair price her farmers and merchants will have no possible cause for complaint.

We hear less of demoralization in prices than at any previous period that we can remember. The fact is, that trade is good, and as long as this continues there is no incentive for offering baits, or any of the other multifarious schemes for attracting business, usually indulged in when trade is sluggish and indifferent.

Owing to the fact that retail merchants throughout the territory west of the Missouri River realize that ample stocks of goods are carried by all the jobbers located in the cities on this river, and that their selling prices are at least equal to those of some, perhaps larger, markets Eastward, it is their preference and interest to place their business directly with the home markets. The disposition of trade in this direction is daily becoming more apparent, and appreciating the situation it is to be noticed that competition from more Eastern markets has materially diminished, simply because it has become unprofitable.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—The Northwest has been favored with delightful weather during the first half of October, and our farmers have been using every hour of it in pushing forward their fall work. As a result, threshing has progressed rapidly, also plowing, and if the last half of the month proves as favorable November 1 will find the fall work unusually well along.

For the present trade has not been helped by such favorable weather, as farmers are too busy to buy or use much Hardware, and the country retail trade in all agricultural districts has been correspondingly dull, and this condition of things has been felt to some extent in turn by the jobbers, although the Hardware houses cannot complain of the October trade, and this weather is of so much value in saving the present crop and preparing for the crop of next year that even if the trade had been temporarily somewhat below expectations it would be accepted cheerfully.

Collections have been fair and that is all, the same influences that have affected trade also being felt on collections. When our farmers can plow or thresh in the fall they will not devote much time to hauling grain to market in order to pay debts that do not press them, and merchants are too much interested in the prosperity of their customers to compel them to stop their plows or threshers this fine October weather, so that the bulk of collections will be late, but we still think the final outcome will be satisfactory to the diligent merchant—wholesale and retail. There is nothing special in prices. Some things are cut below reasonable profits, but, on the whole, there is less of it than usual.

San Francisco.

HUNTINGTON-HOPKINS COMPANY.—An improvement in country trade is to be noted. Collections are in about the same general condition as for some time. An advance in Iron Pipe has taken place, the

prices of other staples continuing without quotable change.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The last two weeks has been another period of uneventful changes. There have been no perceptible signs of diminution in trade, although some houses intimate that, as a rule, recent salesmen's orders are not quite up to the desirable length or variety they had anticipated during the first two weeks of October. One could not, however, justly construe this into complaints as to the general volume of trade, and varied signs of activity are seen in all the houses.

The Presidential campaign, which is growing somewhat more vigorous locally, is not causing any appreciable disturbance to trade, although unquestionably more time is being given to discussing the situation as the nearness to the election approaches.

Prices in general Hardware remain unchanged. Ordinary Plain Wire, with which Barb Wire sympathizes, shows signs of weakness, and has actually gone another step toward the ground floor, and concessions are offered in Barb Wire for large lots, f.o.b. factory.

Recent inquiries for Barb Wire from Cape Town, Africa, necessitated a careful investigation as to whether to accept or decline an order. Upon investigation we found that the ordinary Galvanized Barb Wire could be purchased from the manufacturers in this country at about 20 cents per 100 pounds less than it could be bought from English manufacturers. This country was, however, placed at a decided disadvantage regarding shipments. Not having any line of steamers direct to Cape Town, shipments must therefore necessarily go via Liverpool or London, England, and there be transferred to steamers going direct. This disadvantage alone lost the order to the American manufacturers, and a few American specialties only could be profitably sent forward, owing to our disadvantage in making shipments.

The developments of the investigation were that the system of subsidizing steamships adopted by England, which has been the means of bringing millions and billions of dollars of trade to the manufacturing industries of that country, finds disfavor with the political elements in our country, and while it is being used by them with such prejudicial effects, we, as a country, are not likely to advance materially in merchandise exports to distant countries. England has largely built up her foreign trade in a manner which fails to find advocates with those who rule our destinies in the halls of Congress. Direct lines of steamers to distant ports, like some other infant industries, need fostering, protecting or subsidizing until they are self sustaining.

Another development was that Barb Wire could be bought in England for $2 per ton less, when wanted for export. Our country has been given to understand by those who were supposed to speak with authority that only in this country could manufacturers be found guilty of that obnoxious sin with which our manufacturers are stigmatized in the halls of Congress, of occasionally giving lower prices for export, in order to reduce overstocks, than they have given for home trade. Barb Wire, when sustained by patents, like many other patent-protected articles, was held at unnecessarily high prices, but the aggressive and restless eye of the American manufacturer did not permit a long time to intervene after the expiration of the issued patents before competition wiped out prospective profits.

This, we see, is frequently the case on patented articles of ready sale. Machinery, patterns, and frequently stock made up, are ready for the market at the expiration of patents on an article which has been held above manufacturers' ordinary profits, and are placed upon the market simultaneously with the expiration of the patent; then comes fierce American competition, and the consequence is but little profit to the manufacturer.

Wire Nails have sympathized with both Plain and Barb Wire, and are offered at a low price never before reached. The manufacturers state that they are sold at the actual cost of production rather than pile up stock this season of the year. If the same decline should continue for the next two years as has obtained the last year, Wire Nails would be given free of charge.

These declines coming simultaneously with the improved condition of the Pig-Iron market is rather remarkable. The consumption of Pig Iron during the last six weeks has been in excess of the present output, and reported sales have reduced accumulated stocks in hand many thousand tons.

Railroad earnings show an increase over the phenomenal earnings of the same period in 1891, indicating an unlooked-for increase in freightage.

There appears to be somewhat of an improved feeling regarding business in the cities of the Southern States. Merchants are giving orders less reluctantly.

Collections continue fair. There is quite a noticeable difference in this respect in some portions of the South, from which we may infer that remittances occasionally depend largely upon persons themselves, more than upon the inability of the location. This is demonstrated during the last two months. Ambition to collect and discharge debts is frequently visible in locations where other customers report "it is impossible to make collections."

Portland, Ore.

FOSTER & ROBERTSON.—Trade is a little disappointing, not being up to the mark we had expected for October. This is partly owing to the farmers not being willing to sell their grain at the prices now prevailing. Last year the price of wheat advanced very materially in November, so that many are hoping for the same change for the better this year. The merchants crowding collections where they can, of course keeps the farmers from buying for the present until they dispose of their crops and are able to make settlement with their creditors.

Our rainy season will soon set in, making bad roads, so that the outlook for business the rest of the year is not as bright as it might be. The only change in prices to note is a decline in price of Nails, Steel Cut now selling at $2.35, and Wire at $2 45 base.

Cleveland.

THE W. BINGHAM CO.—Our prediction, made soon after the Presidential nominations, that there would not be the usual disturbance to trade this fall from political causes has been fulfilled. We have never before experienced a Presidential campaign where there has been so little excitement and so little cause for complaint as to interference with trade. Business has been exceptionally good, and the demand keeps up remarkably well. The factories in some lines are from two to four weeks behind on their orders, but prices still show a strange tendency toward weakness. City retailers report business as excellent in almost every line, Gas Stoves (which are getting to be quite a feature in the trade) being particularly in demand. Barbed Wire is being sold from stock at $2.55 for Galvanized, with the usual reduction for Painted; Wire Nails at $1.55. There is very little demand for Cut Nails at any price.

Louisville.

W. B. BELKNAP & CO.—We have to report a large movement of goods, both staple articles and smaller Assorted Hardware as well. The state of trade at large is healthy, as we are feeling the effect of the good crops for two years, coupled with close, economical buying for actual wants during that whole time. The advance in the price of raw cotton in the past month has had a stimulating influence upon the South. The only complaint now heard in the rural districts is of the drought, which is most persistent. The river keeps on receding, and navigation is consequently still more restricted. The railroads are accordingly crowded with business and are making the poorest time on record—12 to 14 days from Pittsburgh to this point is not at all unusual. As the rail freight rates are about as high as they were 15 or 20 years ago, when there was but one single line from that part of the country here, it would seem as though their facilities, either in the way of track, cars or motive power, were deficient, or else the organization is not of high enough order to employ these facilities to the best advantage. When a passenger comes through from Youngstown or Pittsburgh in a little over 12 hours, it seems preposterous that it should take freight 20 to 30 times as long; but such is the case to-day.

Although it is the Presidential election year, we should hardly know it except for occasional reference to it in the newspapers. There has never been a time when this was less a disturbing factor than now. This is the result of each party believing that should its opponent achieve the victory there will not be any such disturbance or upheaval of the existing state of affairs as will precipitate serious trouble. There

is an abiding confidence in the good sense of the country at large.

The rulings of Judge Paxson of Pennsylvania, as to what constitutes serious offenses against the State amounting to treason, will have a reassuring influence the country over. It will put, we think, a little necessary backbone into other wearers of the so called "judicial ermine," and those desiring to enter upon plans for development of the material resources in any State will feel that property rights have some show when all is said and done.

The condition of affairs of practically seizing a town and not permitting ingress or egress or unimpeded movement in it by any body of men not specially authorized by the State is intolerable. This must be recognized, no matter what specious reasoning may be employed by partisans to persuade themselves otherwise.

Notes on Prices.

Cut Nails.—An improved demand for Cut Nails is reported, with a continuance of prices on substantially the same basis as for several weeks. In the East, Association prices are on the whole well maintained. While they are shaded in special cases, quotations are still on a basis of $1.65 for Steel Nails in carload lots at mill, on a 25 or 35 cent average, with equalization of freight. Iron Nails are held quite steadily at 3 cents per keg less, and on 1000-keg lots of either Iron or Steel Nails an abatement of 5 cents is made. New York prices for carlord lots of Cut Nails on dock are as follows:

	Iron.	Steel.
25 to 30 cent average extra	$1.77	$1.80
31 to 39 " " "	1.72	1.75
40 to 49 " " "	1.67	1.70
50 cents and up " "	1.62	1.65

Lots of 1000 kegs, 5 cents a keg less than above prices.

Steel Nails from store in New York are held at $1.85, and Iron Nails at $1 82.

Chicago, by Telegraph.—The local makers report good demand for Steel Cut Nails with shipments quite up to the average for busy seasons. Some heavy orders have recently been booked. Prices are maintained at $1.62½ to $1.65 on 30 cent average. The trade does not seem to be affected by the low prices now current on Wire Nails, but on the contrary orders continue to be received from sections in which Wire Nails were long ago reported as having driven out Cut Nails. Jobbers report small lots from stock selling at $1.70 to the country trade; but in the city, where competition is sharper, they are bringing but $1.65.

Wire Nails—An excellent demand is reported, but prices are devoid of strength. For carload lots at mill $1.50 is the general quotation, but $1.45 has been made on some large purchases. The condition is thus not improved since our last review.

Chicago, by Telegraph.—An excellent inquiry is noted for Wire Nails and the leading Western manufacturers have made numerous sales on the basis of $1.60, Chicago. This price is being shaded by some manufacturers, however, and the outlook is not regarded as satisfactory. Low lake freights have enabled shipments to be made to St. Paul at $1.60, delivered, and this reacts on the Chicago trade. New Wire Nail concerns are also coming into the field in this vicinity, and as the season is now rapidly drawing to a close there will be a keen competition for the limited trade to be had during the late fall and winter. Jobbers are selling small lots from stock at $1.75, their prices being based on purchases made some time since, when Wire Nails were considerably dearer.

Barb Wire.—The Eastern mills report an increased demand and the volume of business is good. Prices are, however, without important change with a slight tendency toward lower figures. We still quote round lots at mill at $2.55. Store prices in New York are $3.10 for small lots, an abatement of 10 cents being made in carloads.

Chicago, by Telegraph.—The event of the week was the reduction on double Glidden Wire made by the I. L. Elwood Mfg. Company of Dekalb. Lots of 10 tons or over are now quoted $2.25 Painted and $2.65 Galvanized, with no guarantee on prices hereafter on any Wire on hand should a further reduction be made. These prices are equivalent to $2 10 Painted and $2.50 Galvanized on standard makes of Wire. Trade in Barb Wire is very quiet and jobbers continue to quote small lots at former prices.

Chain.—Owing to changes in the cost of production the lists of Trace and Fancy Chains have had many inequalities calling for revision. The leading Eastern manufacturers have accordingly adopted a revised list of Chain, in which these discrepancies are corrected and the prices made to correspond with the present cost of production. The new list prices are represented below in the list, which bears date October 15, of the Nes Chain Manufacturing Company, York, Pa., for whom Surpless, Dunn & Alder, 97 Chambers street, New York, are agents:

Long Traces.

Bright or Black—Straight Links.

American size.				English size.			Per pair.
6½ feet,	6,	4	6½ feet,	8,	3		$0.65
6½ "	8,	4	6½ "	10,	3		.74
6½ "	10,	4	6½ "	12,	3		.82
6½ "	12,	4	6½ "	14,	3		.95
6½ "	14,	4	6½ "	16,	3		1.05
6½ "	5,	3	6½ "	6,	2		.69
6½ "	6,	3	6½ "	8,	2		.72
6½ "	8,	3	6½ "	10,	2		.82
6½ "	10,	3	6½ "	12,	2		.92
6½ "	12,	3	6½ "	14,	2		1.05
6½ "	14,	3	6½ "	16,	2		1.20
6½ "	16,	3	6½ "	18,	2		1.35
6½ "	18,	3	6½ "	20,	2		1.65
6½ "	6,	2	6½ "	8,	1		.82
6½ "	8,	2	6½ "	10,	1		.93
6½ "	10,	2	6½ "	12,	1		1.03
6½ "	12,	2	6½ "	14,	1		1.20
6½ "	14,	2	6½ "	16,	1		1.40
6½ "	16,	2	6½ "	18,	1		1.65
7 "	6,	4	7 "	8,	3		.72
7 "	8,	4	7 "	10,	3		.80
7 "	10,	4	7 "	12,	3		.90
7 "	12,	4	7 "	14,	3		1.05
7 "	14,	4	7 "	16,	3		1.15
7 "	16,	4	7 "	18,	3		1.30
7 "	6,	3	7 "	8,	2		.78
7 "	8,	3	7 "	10,	2		.90
7 "	10,	3	7 "	12,	2		1.00
7 "	12,	3	7 "	14,	2		1.15
7 "	14,	3	7 "	16,	2		1.35
7 "	16,	3	7 "	18,	2		1.50
7 "	18,	3	7 "	20,	2		1.90
7 "	6,	2	7 "	8,	1		.90
7 "	8,	2	7 "	10,	1		1.05
7 "	10,	2	7 "	12,	1		1.23
7 "	12,	2	7 "	14,	1		1.30
7 "	14,	2	7 "	16,	1		1.55
7 "	16,	2	7 "	18,	1		1.80
7 "	8,	1	7 "	10,	0		1.30
7 "	10,	1	7 "	12,	0		1.45
7 "	12,	1	7 "	14,	0		1.75

T Bar, 2 cents net per pair extra.
Hooks or T Hooks, 2 cents net per pair extra.

Long Traces.

Bright or Black—Twist Links.

American size.				English size.			Per pair.
6½ feet,	6,	4	6½ feet,	8,	3		$0.70
6½ "	8,	4	6½ "	10,	3		.79
6½ "	10,	4	6½ "	12,	3		.88
6½ "	12,	4	6½ "	14,	3		1.02
6½ "	14,	4	6½ "	16,	3		1.12
6½ "	6,	3	6½ "	8,	2		.77
6½ "	8,	3	6½ "	10,	2		.87
6½ "	10,	3	6½ "	12,	2		.98
6½ "	12,	3	6½ "	14,	2		1.12
6½ "	14,	3	6½ "	16,	2		1.28
6½ "	16,	3	6½ "	18,	2		1.43
6½ "	18,	3	6½ "	20,	2		1.75
6½ "	6,	2	6½ "	8,	1		.88
6½ "	8,	2	6½ "	10,	1		.99
6½ "	10,	2	6½ "	12,	1		1.10
6½ "	12,	2	6½ "	14,	1		1.27
6½ "	14,	2	6½ "	16,	1		1.48
6½ "	16,	2	6½ "	18,	1		1.75
7 "	6,	4	7 "	8,	3		.77
7 "	8,	4	7 "	10,	3		.85
7 "	10,	4	7 "	12,	3		.96
7 "	12,	4	7 "	14,	3		1.12
7 "	14,	4	7 "	16,	3		1.22
7 "	16,	4	7 "	18,	3		1.40
7 "	6,	3	7 "	8,	2		.84
7 "	8,	3	7 "	10,	2		.96
7 "	10,	3	7 "	12,	2		1.07
7 "	12,	3	7 "	14,	2		1.22
7 "	14,	3	7 "	16,	2		1.43
7 "	16,	3	7 "	18,	2		1.58
7 "	18,	3	7 "	20,	2		2.00
7 "	6,	2	7 "	8,	1		.96
7 "	8,	2	7 "	10,	1		1.11
7 "	10,	2	7 "	12,	1		1.30
7 "	12,	2	7 "	14,	1		1.38
7 "	14,	2	7 "	16,	1		1.64
7 "	16,	2	7 "	18,	1		1.90
7 "	8,	1	7 "	10,	0		1.37
7 "	10,	1	7 "	12,	0		1.53
7 "	12,	1	7 "	14,	0		1.85

T Bar, 2 cents net per pair extra.
Hooks or T Hooks, 2 cents net per pair extra.

Stake Chain.

Large Ring, Swivel and Hook.

American size.				English size.			Per pair.
6½ feet,	8,	4	6½ feet,	10,	3		$0.87
6½ "	10,	4	6½ "	12,	3		.92
6½ "	8,	3	6½ "	10,	2		.94
6½ "	10,	3	6½ "	12,	2		1.06

Twist, 2 cents net per pair extra.

Half Traces or Butt Chain.

With Ring or Hook—Straight Links.

American size.	12 in.	18 in.	24 in.	30 in.	36 in.	42 in.
8 links;	4..19	24	33	39	44	51
10 "	4 21	26	35	41	49	57
12 "	4..25	30	37	44	52	60
14 "	4..27	32	39	49	57	66
16 "	4..32	38	43	52	62	72
18 "	4..37	44	53	59	71	84
8 "	3..23	28	35	42	50	58
10 "	3..25	30	37	44	53	62
12 "	3..27	32	39	48	57	68
14 "	3..34	40	45	55	65	78
16 "	3..38	44	52	59	71	84
18 "	3..45	52	60	69	85	101
8 "	2..27	32	39	47	55	64
10 "	2..31	36	43	50	60	68
12 "	2..33	40	47	54	65	76
14 "	2..39	47	56	61	75	86
16 "	2..43	52	60	67	80	96

Twisted, 1 cent net per pair extra.
T Bar, 2 cents net per pair extra.
Hooks or T Hooks, 2 cents net per pair extra.

Stiff Traces.

Black—Straight Link.

American size.			Per pair.
6½ feet,	22,	3	$2.75
7 "	22,	3	3.00
36 inches,	22,	3	1.35
32 "	22,	3	1.50

Stage Traces.

Clips and Hook T, or Cross Bar—Bright or Black.

American size.			English size.			Per pair.
2 feet,	14,	3	2,	16,	2	$0.73
2 "	14,	2	2,	16,	1	.79
3 "	10,	4	3,	12,	3	.66
3 "	12,	4	3,	14,	3	.71
3 "	14,	4	3,	16,	3	.75
3 "	16,	4	3,	18,	3	.85
3 "	18,	4	3,	20,	3	1.05
3 "	8,	3	3,	10,	2	.68

3	feet	10, 3	3,	12, 2		.74
3	"	12, 3	3,	14, 2		.79
3	"	14, 3	3,	16, 2		.84
3	"	16, 3	3,	18, 2		.95
3	"	18, 3	3,	20, 2		1.10
3	"	8, 2	3,	10, 1		.73
3	"	10, 2	3,	12, 1		.79
3	"	12, 2	3,	14, 1		.84
3	"	14, 2	3,	16, 1		.95
3	"	16, 2	3,	18, 1		1.10
3½	"	14, 4	3½,	16, 3		.84
3½	"	16, 4	3½,	18, 3		.95
3½	"	18, 4	3½,	20, 3		1.15
3½	"	8, 3	3½,	10, 2		.75
3½	"	10, 3	3½,	12, 2		.82
3½	"	12, 3	3½,	14, 2		.88
3½	"	14, 3	3½,	16, 2		.95
3½	"	16, 3	3½,	18, 2		1.03
3½	"	18, 3	3½,	20, 2		1.22
3½	"	8, 2	3½,	10, 1		.82
3½	"	10, 2	3½,	12, 1		.90
3½	"	12, 2	3½,	14, 1		.97
3½	"	14, 2	3½,	16, 1		1.10
3½	"	16, 2	3½,	18, 1		1.21

With Snap Clip and Ring, 18 cents per pair extra.
With Snap, 9 cents per pair extra.

Wagon Chain.

Any Length or Style Required.

	¼ inch.	5-16 inch.	⅜ inch.
Stay	Per lb. 15 cts.	13 cts.	12½ cts.
Tongue	" 15 "	13 "	12½ "
Lock	" 16 "	14 "	13½ "
Stretcher	" 17 "	15 "	14½ "
Fifth	" 17 "	15 "	14½ "

Breast Chains—Pennsylvania Pattern.

Bright or Black, With T Bar.

Per pair.

26 inch 5-16 inch iron, Double Twist, heavy taper at the end stiff.....$1.00
26 inch ¼ inch iron, Double Twist, light taper at the end stiff..... 1.00
26 inch 5-16 inch iron, Single Twist, stiff. 1.00
26 " ⅜ " " " " " .. 1.00

Breast Chain

With T Bar.

American size.	English size.	Per pair.
24 inch, 10, 3	24 inch, 12, 2	47 cts.
26 " 10, 3	26 " 12, 2	50 "
27 " 10, 3	27 " 12, 2	53 "
30 " 10, 3	30 " 12, 2	56 "
24 " 10, 2	24 " 12, 1	53 "
26 " 10, 2	26 " 12, 1	54 "
27 " 10, 2	27 " 12, 1	55 "
30 " 10, 2	30 " 12, 1	60 "
27 " 9, 4		43 "
27 " 8, 3	27 inch, 10, 2	45 "
27 " 9, 3		46 "
27 " 9, 2		52 "
27 " 9, 5-16		71 "
28 " 9, 5-16		75 "
30 " 9, 5-16		82 "
24 " tapered 5-16 to ¼		54 "
27 " " 5-16 to ¼		60 "
34 " " 5-16 to ¼		74 "
27 " Double Slack Twist		80 "
30 " " " "		85 "
27 " 10, 3 Malleable Slide		60 "

Snaps one end, 18 cents per pair extra.

Cow Ties.

Open and Shut Ring Patterns—With T Bar.

			Shut Ring. Per doz.	Open Ring. Per doz.
3	feet, No.	6	$3.10	$3 60
3½	" "	6	3.33	3.90
4	" "	6	3.68	4.20
4½	" "	6	3.91	4.64
3	" "	5	3.44	3 77
3⅛	" "	5	3 63	4.02
4	" "	5	3.98	4 45
4½	" "	5	4.39	4.95
3	" "	4	3 52	3.83
3⅛	" "	4	3.74	4.20
4	" "	4	4.01	4.51
4½	" "	4	4.41	5.00
4	" "	3	4 45	4.96
4½	" "	3	4.85	5.23

Snaps, 20 cents per dozen net, extra.

Ohio Pattern.

		4½ feet.	5 feet.	5½ feet.
No. 1 Wire	Per doz.,	$5.25	$5.75	$6.25
No. 2 "	"	4.85	5.40	5.82
No. 3 "	"	4.56	4.80	5.20
No. 4 "	"	4.14	4.30	4.75
No. 5 "	"	3.85	4.03	....
No. 6 "	"	3.60	3.78	....

Snaps, 20 cents net, per dozen extra.

Halter Chain.

Sheffer's Pattern, 4½ Feet Long—With Two T Bars.

Per doz.

3-16 Iron Twisted No. 1, Short Links.....$5.50
3-16 " Straight No. 1, " 5.45
3-16 Iron Twisted No. 2, Long Links..... 4.25
No. 4 Wire, Short Link..... 5.75
No. 4 " Long " 4.80

Ox and Log Chain.

Long Link—Bright or Black—Hook and Ring.

Per pound.

¼ inch	15 cents.
5-16 "	13 "
⅜ "	12 "
7-16 "	11½ "
½ "	11 "
⅝ "	10 "

Log Chain.

Short Link with Grab Hook.

Per pound.

¼ inch	17 cents.
5-16 "	14½ "
⅜ "	13½ "
7-16 "	13 "
½ "	12 "
⅝ "	11½ "

Running or Back Cart Chain.

Bright or Black.

					Per dozen. With one Swivel.	Per dozen. With two Swivels.
4	feet	¼ inch	Double Twist.		$9.00	$10.00
4	"	5-16 "	Single	"	7.50	8.25
4½	"	¼ "	Double	"	10.50	11.25
4½	"	5-16 "	Single	"	8.00	9.00
4	"	2 "	"	"	5.00	5.25
4½	"	2 "	"	"	5 50	6.25
4½	"	⅜ "	"	"	12.00	13.00
4½	"	5-16 "	Double	"	15.00	16.00

South Jersey Traces.

Plain Twist Chain with Two Hooks—Clips and Rings Extra.

42 inch 12 x 3.....Per pair, 83 cents.
42 " 12 x 4..... " 76 "
With Clip and Ring 8 cents per pair extra.

Breeching Chain.

Large Clip, Ring, Long Rings, Bright or Black.

Per pair.

Made of No. 3 wire.....$0.45
" " " 5-16 " ..... .60
12-inch straight links, with bolt, 2, 2½ and 3-inch, No. 3 iron..... .32
12-inch, straight links, with bolt, 2, 2½ and 3-inch, No. 2 iron..... .40

Tug Chain.

American size.	English size.	Per pair.
18-inch, 8, 3	18 inch, 10, 2	$0.20
18 " 10, 3	18 " 12, 2	.23
18 " 8, 2	18 " 10, 1	.24
18 " 10, 2	18 " 12, 1	.26
18 " 10, 1	18 " 12, 0	.35
16 " 10, 1	16 " 12, 0	.33
16 " 8, 1	16 " 10, 0	.30
18 " 10, 5-16		.40

Chin Chains.

Bright or Black.

Per dozen.

Double Twist, No. 9 wire.....$3.00
Single " No. 6 " 1.30

Carrying Chain.

Bright or Black.

Each.

Double Twist, 3-16 inch iron.....$2.00
Single " 3-16 " 1.25

Line Chains.

Black or Bright.

Per pair.

Single Twist, 3-16 inch wire.....$0.30

Heel or New York City Traces.

With Clip or Swivel D and Hook.

		No. 3 iron.	No 2 iron.
12-inch	Per pair	$0.27	$0.29
18 "	"	.40	.42
24 "	"	.47	.49
30 "	"	.54	.57
36 "	"	.62	.65
42 "	"	.70	.73
12 "	straight links, with D without Hook..	.23	.24
12 "	straight links, with Clip, without Hook.....	.28	.32

Well Chain.

With Ring and S Hook.

American size.	English size.	Each.
30-inch 6, 4	30-inch 8, 3	$0.15
36 " 6, 4	36 " 8, 3	.17
30 " 8, 4	30 " 10, 3	.18
36 " 8, 4	36 " 10, 3	.22
30-inch 6, 3	30-inch 8, 2	.18
36 " 6, 3	36 " 8, 2	.20
30 " 8, 3	30 " 10, 2	.21
36 " 8, 3	36 " 10, 2	.25
30 " 6, 2	30 " 8, 1	.22
36 " 6, 2	36 " 8, 1	.24
30 " 8, 2	30 " 10, 1	.26
36 " 8, 2	36 " 10, 1	.29

With Swivel, 2 cents extra.

Rein Chain.

Per foot.

12-inch,	13, 9	$0.27
18 "	13, 9	.33
24 "	13, 9	.42
30 "	13, 9	.50
36 "	13, 9	.55
42 "	13, 9	.62
48 "	13, 9	.70

Wagon Chains.—Close Link.

Black or Self-color.

Per pair.

Tongue	2½ feet,	⅛ iron		$1.75
"	3 "	11-32 "		1.50
"	34 inch	5-16 "		1.32
Stay	2½ feet	3-8 "		1.15
"	2½ "	5-16 "		1.00

Fifth Chains.

Black or Self-color.

Each.

3-8 iron,	Close Link,	straight			$4.12
5-16 "	"	"	"		3.85
3-8 "	"	"	twisted		4.40
5-16 "	"	"	"		4.12

Spreader Chain.

With three Hooks.—Black or Self-color.

3-8 inch iron,	Close Links,	straight,	2 horse		$1.65
5-16 "	"	"	"	1 "	1.50
5-16 "	Double Twist for 2 horse				2.00

Jockey Stick Chain.

Per doz. pair.

Single Twist, 3-16 iron.....$3.00

Wrought-Iron Pipe.—The combination among the Wrought-Iron Pipe manufacturers is strong and in a very satisfactory condition. At a meeting held last week, in view of the contracts which a number of the mills have recently secured for large sizes of Pipe, and of the promising outlook for the next 90 days, it was thought advisable to advance prices. The discounts were accordingly diminished. An advance was also made in the list prices of 1¼-inch Pipe, the new list being as follows:

	Cents.
1¼ inch, black	24
1¼ inch, galvanized	28
1¼ inch, tarred	30
1½ inch, extra heavy	48
1½ inch, XX heavy	96

Carriage Bolts.—At a meeting of the manufacturers of Common Bolts held in New York last week, no change was made in quotations. The matter of irregularities in price received some attention, but it did not seem feasible to take energetic measures to prevent them. The regular quotations on these goods are therefore to a good extent nominal, as large purchasers are enabled in one way or another to obtain the goods at much lower figures.

Shot.—The prices which are ruling for Lead while affecting Sheet Lead and Lead Pipe have not as yet produced reduced prices on Shot, which is held firmly at former quotations.

Seamless Brass Tubes.—Under date of October 17 the American Tube Works, 79 State street, Boston, and 20 Gold street, New York, issue a list of Seamless Brass Tubes and Copper Tubes, in which prices are advanced 1 cent, making it correspond with that of the associated manufacturers.

Glass.—The great event of the week among the Glass trade was the starting of the Chambers Glass Company's new works

at New Kensington, Pa. Only one tank, employing 72 blowers, is now in operation, but fire is now in the second tank, and it is expected will be ready to blow from in about ten days. When the second tank starts the plant will have a capacity equal to 144 pots. Two more tanks of like capacity, it is expected, will be completed in the spring. The tank now in operation holds 825 tons of molten glass, and the tank with its glass weighs about 3000 tons. Factories report an increasing demand for glass, and out-of-town trade is reported as satisfactory by city dealers. City business is not, however, what could be desired, and complaint is made of the small margin of profits. American Glass is being sold in small lots at 80 and 10 to 80 and 10 and 5 per cent discount. Imported Glass remains firm at 80 per cent. discount. Quotations remain unchanged, as follows: American Window Glass, 1000-box lots or more, 80 and 20 per cent. discount; carloads, 80, 10 and 5 per cent. discount; less than carloads, 80 and 10 per cent. discount. French Window Glass, 80 per cent. discount. American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

LETTER FROM

Polhemus Lyon,

(*Our Special Foreign Representative.*)

SYDNEY, N. S. W., September 5, 1892.

To the Editor: Both Melbourne and Sydney have a Hardware association, but in Sydney alone do the wholesale ironmongers bind themselves to a scale of prices, which they live up to rather more faithfully than in some other parts of the world that I am conversant with.

"Convention prices," as they are called in this city, cover a very large line of Hardware, but hold good only for a fixed quantity, such as the retailer would ordinarily buy, six dozen Rim Locks of popular numbers and three dozen of some others, while for quantities beyond this the seller makes what prices he chooses; but good profits are the rule, even Axes averaging 15 per cent., and many lines nearer 50 per cent., on actual laid down cost. Melbourne, however, is a much closer market than the other colonial centers.

There is hardly such a thing as an open account, all being closed at the expiration of 30 days by a four months' "bill," without interest, money being too valuable a commodity here for the usual cash discount of 2½ per cent. to avail.

I have received two or three inquiries from Hardware manufacturers for information on trade-marks and patents. It may not be without interest, therefore, to the readers of this journal to get a little light on the matter so far as the Australasian colonies are concerned; indeed, there is an incentive to all manufacturers doing a foreign trade, and especially with the English colonies, to establish their right to a specific trade-mark. In the United States the most popular and the oldest established makers find the sharp competition from comparatively new houses, who have their reputation still to make. Not so in "the colonies"—here a maker unknown to the colonial trade finds it almost impossible to make headway against a well-established competitor.

Ames' Shovels, Disston's Saws, Sharp's Axes, in most of the colonies, and Collins' in some, Cheney Hammers, Douglas Chisels, in this colony, Yale Night Latches and some other lines hold the field, hardly losing through efforts made by competitors to get in. Buyers, especially in Sydney, often say to me, "Ours is not an introducing house," using the same phrase with stereotyped monotony. Importers here do not care to have private brands of their own, and are prejudiced against goods which do not carry the maker's name.

These several points add to the value of the colonial trade-mark, while the tendency toward real protective duties makes the colonial patent more valuable as well.

The important feature in a trade-mark is that of distinctiveness, and this is absolutely necessary. The name of the person or firm impressed or woven in some particular or distinctive manner; a distinctive device, mark, brand, label or fancy work not in common use, a *fac-simile* of applicant's signature—either of these constitutes a good trade-mark, it being necessary to make it perfectly clear that if a question of infringement arises there need be no hesitancy in proving what it is that is being infringed, and that this something is quite different from all other marks used upon the same class of goods.

The Collins Axe Company won a test case which decided that an alien has equal privileges with a subject in acquiring and holding a trade-mark.

The original registration of a trade-mark is for a period of 14 years, and no difficulty need be apprehended from the prolongation of registration, for the exclusive ownership of a trade-mark is protection against fraud, a small fee being paid at each renewal. After five years have expired from date of registration, the fact of having been unmolested becomes conclusive evidence of owner's right to the mark. Colonial agents of foreign trades will be restrained from selling goods falsely marked; so, too, commission merchants shipping with the knowledge that the goods they send are so marked as to deceive.

An application must be accompanied by three representations of the trade-mark, and must state the particular goods or classes of goods in connection with which the applicant desires the trade-mark to be registered—if to be made of metal, the kind of metal must be stated.

Manfield Newton of Elizabeth street, Sydney, is a civil and a mechanical engineer and patent attorney of some reputation, doing considerable business for some of our great American manufacturers. In true English style he has followed the profession of his father and grandfather, who built up a large business of this nature in London. I learn from him that the entire cost in Australasia for registering a trade-mark is as follows:

New South Wales, $20; Victoria, $25; South Australia, two applications are needed, with costs in all of $45; Queensland, $30; New Zealand, $20.

The first three are of chief interest in this connection, and Victoria alone manufactures half the Australasian products. In New South Wales, Victoria and South Australia it costs $61 each to obtain a patent; in Queensland $66, and in New Zealand $51, the life of the patent throughout Australia being in some of the colonies for all time, while in others a tax is made at expiration of 14 years.

These charges cover all ordinary expenses. Provisional protection in each of the colonies can be obtained for $26 each, and patent completed later for $60 each.

POLHEMUS LYON.

St. Joseph Pump Company.

A REPRESENTATIVE of *The Iron Age* was recently shown through the works of the St. Joseph Pump Company, St. Joseph, Mo., which concern is one of the most flourishing of that busy city. This firm started in business in the spring of 1886, purchasing a 7-acre tract of land (then a corn field) just south of the city limits, where they erected two brick buildings, two stories and a basement, 50x170 feet, with metal roofs. In the first building is located the company's offices and all their machinery. The first floor contains their iron-working and the second their wood-working machinery. The other building is used for storage, shipping and painting, and the general finishing is also done there. The two buildings are divided by the company's own switch, which for shipping facilities cannot be excelled. They are in direct connection with all the great trunk lines in the West, namely, the C. B. & Q., Mo. Pac., Chicago, Rock Island & Pacific, Atchison, Topeka & Santa Fé, Chicago & Great Western, Wabash, and in fact every road entering the city. Owning their own switch they have no switching charges to pay, as every road by virtue of passing their plant have a key to their switch. The company have their own boarding house, a two-story frame structure 50x70, containing 42 well ventilated rooms, which is conducted for the convenience of their workmen. Their factory is equipped with all conveniences. They use the overhead system of steam heat, which we are informed heats to a temperature of 60° in the coldest weather. The main buildings are supplied with electric bells and electric stations distributed over the entire plant, a tour of which the watchman is required to make every half hour during the night. In addition to this they operate their own galvanizing plant, a frame building 30x90 feet, where no work is done but that of the company in the manufacture of the well known Perfection Purifying Pumps. The company do all their own repairing, having a repair shop 30 x 40 feet, in which they make all their own tools and dies. Their engine and boiler room is located on the ground floor, an Ide & Son high speed, automatic engine being in use. Their large and commodious dry room is capable of storing four carloads of lumber at one time. The entire plant is supplied throughout with city water, having a pressure at their factory of 140 pounds. The company have had the same officers since their organization. The secretary and general manager, E. A. King, has had and retains full charge of the plant—in fact, Mr. King laid out the plant and supervised its erection.

Manning, Bowman & Co.

MANNING, BOWMAN & CO., Meriden, Conn., and 57 Beekman street, New York City, have just issued an illustrated catalogue and price list of their leading specialties. The volume is artistically arranged, beautifully printed, and considered as a whole is among the most elaborate trade publications of its kind. The 342 pages of which the work is composed measure 11 x 14 inches, and are bound in board covers of a dark green color. The volume is divided into four sections, the first being devoted to Tea and Coffee Pots and sets in pearl agate, granite iron, britannia, copper and tin, *tête à tête* sets, Swing Kettles, Tea Caddies, Five O'Clocks and Cocoa Pots; the second section to Coffee Mills, Tea Pot Stands, Tea Balls and Strainers, Crumb Trays and Brushes, Waiters of all kinds, Soup Tureens, Baking Dishes, Syrup Pitchers, Chafing Dishes, Cereal Cookers, &c., the third section to Toilet Ware, Cuspidors and special goods for the hotel, restaurant, *café* and club, while the last section is given up to Urns for coffee, tea, milk and soda, made of chemically pure enameled steel and porcelain with improved heating apparatus; also Planished Chafing Dishes and Soup Tureens. The descriptive letterpress is ample for the purpose, and the illustrations are profuse and well executed. The greater portion of the volume is devoted to what the manufacturers are pleased to designate as patent decorated Pearl Agate Ware, patented in 1883 and registered in 1885. In many instances the right-hand pages carry beautifully executed illustrations of this Ware, which is made with white metal mountings and protection bands. Portions of the articles shown are printed in colored designs in imitation of the original, the work being exceedingly clever. There are also colored illustrations in imitation of Copper and Brass Ware, which cannot fail to command the admiration of the trade. The volume, as previously stated, is handsomely gotten up in every particular, and will prove an artistic addition to the literature of the trade.

Craig Silver.

CRAIG SILVER COMPANY, Bridgeport, Conn., are manufacturing Table Knives, Forks, Spoons, Tea Sets and Tea Kettles; also, metal for Builders' Hardware, Car, Carriage and Harness Trimmings, Bicycle Spokes and Mountings, Door Plates, &c., from Craig Silver, which they describe as an admirable substitute for sterling. This metal is described by the manufacturers as follows:

Craig Silver is a non-oxidizing white metal, susceptible of the finest finish, takes a very bright polish and will not readily tarnish. It will resist the action of many of the acids and is not discolored by gases, sulphur and most other substances which will tarnish and discolor other metals. In color it closely resembles silver, and in most instances where used it would not be improved in appearance, or in any other particular, by plating. It is very strong and ductile, having an elongation of 29½ per cent., and a tensile strength of 63,000 pounds to the square inch.

The Table Forks, for instance, are made from one solid piece of the metal, being forged and finished in the same manner as forks made from steel; and it is stated they have equal strength, will not tarnish or corrode more readily than pure silver, and can be cleaned and treated in all respects as if made from silver.

Trade Items.

THE ENTERPRISING Hardware house of Cozens & Harvey, Melbourne, Australia, who, about a year ago, erected a fine building for their business, have equipped the establishment with the Morley Railroad Step Ladder and the cash railway system, an elevator for customers being also employed. This concern is one of the youngest houses in Australia, having branched out of McLean Bros. & Rigg about ten years ago. The growth of the house has been conspicuous, although their business is confined to the retail and suburban wholesale trade. We are advised that they have been very successful in handling American novelties, and nearly 50 per cent. of their stock is obtained from American markets.

H. P. DAVIDSON has purchased the entire interest and good will of Louis Koehl in the Hardware firm of Davidson & Koehl, 176 Ontario street, Cleveland, Ohio, and will settle all outstanding accounts. Mr. Davidson will continue the business alone.

THE NEW MORMON TEMPLE at Salt Lake City is to be fitted throughout with Hardware made by P. & F. Corbin, New Britain, Conn., after their own designs and suggestions from the architect. All of the patterns are special, but the door knobs and escutcheons are somewhat after Corbin's French Renaissance pattern. They are finished in several styles, including gold plate and oxidized silver. The upper part of the escutcheon represents a closed door, above which appears clasped hands, and on opposite corners the dates 1853 and 1893. The knob shows a beehive in the center, and at the top the words, "Holiness to the Lord," in raised letters. Both designs are unique, and the combination of escutcheon and knob is handsome in the extreme, and the emblems and text rather rare in Hardware. The entire outfit was shipped last week.

THE SPRINGFIELD EMERY WHEEL COMPANY, Bridgeport, Conn., successors to the Springfield Emery Wheel Mfg. Company, advise us that they are the owners of all the patents, patterns and records which were the property of the old concern, mentioning that circulated reports to the contrary are without foundation in fact. The business is being conducted at the old plant, and it is stated that the principal foremen and mechanics formerly employed by the Springfield Emery Wheel Mfg. Company are included in the working force. The company advise us that they are in a position to fill all orders for any class of goods manufactured by their predecessors. They have established agencies with M. M. Buck & Co. of St. Louis, and the Fairbanks Company of Philadelphia, in addition to having a branch store at 125 South Clinton street, Chicago, a large stock of Emery Wheels and Machinery being carried at these several points.

THE GLAZIER-STRONG OIL STOVE COMPANY, Chelsea, Mich., in their advertisement on another page call attention to the line of Oil and Gas Stoves which they are putting on the market. They suggest a trial order for these goods, which are described as the latest in design, elegantly finished and honestly constructed.

BELLAIRE STAMPING COMPANY, Harvey, Ill., advise us that on the evening of October 5 a portion of their enameling lant and their retinning furnaces were badly damaged by fire, which will in a measure interfere with their business for the next six weeks or two months. They propose to rebuild the damaged part of the buildings and to replace the damaged machinery immediately. As the enameling and retinning parts of their plant were the only ones damaged they will continue the manufacture of plain Stamped Ware, Zinc Oilers, Mason Caps, Miner and Driver Lamps, Lanterns, Glass Oil Cans, Seamless Flanged Drip Pans, &c. They state that they have fair stocks of Retinned Stamped Ware and Enameled Ware which will help them somewhat while rebuilding.

A PLEASANT TESTIMONY to the value of Ladd's Discount Book has recently been received, as a well-known house in Barbadoes writes in regard to it in the following terms: "We think it might interest you to know that we have had a copy of Ladd's discount book in continual use since April of 1889. We have found it very useful, and its usefulness increases day by day; we really do not know what we should do without it." Strong testimonials are frequently received about the usefulness of this valuable book, but it is seldom that a man way off in the West Indies will write such a letter without any solicitation whatever, and for no other purpose than to express his gratification for something for which he has paid full price.

THE WAREHOUSE of the Albany Hardware & Iron Company, Albany, N. Y., was partially destroyed by fire a few days since. Its dimensions were 180 x 85 feet, and about one-half of the building was injured. The warerooms containing Sheet Iron, Tin Plate and Nails were damaged by water. Another large room in which was stored lighter goods—namely, Snow Shovels, Pump Curbs and Tubing, Wheelbarrows, Lanterns in cases and other goods was almost completely destroyed. The company advise us that their insurance is greatly in excess of the loss, and they hope for a speedy adjustment of affairs, with but slight interruption to their business. As the fire was confined to the warehouse only, their regular shelf business suffers no loss or interruption, as this stock is carried in their State street store, three blocks distant from the warehouse.

THE ILLINOIS PURE ALUMINUM COMPANY, successor to the Cincinnati Pure Aluminum Company, Lemont, Ill., with branch office at 7 Emery Arcade, Cincinnati, Ohio, announce that their new factory will commence operations in November next. Among other manufactured articles, Cooking Utensils will occupy a prominent place. They refer to their fully equipped plant of machinery as enabling them to offer Ingots, Sheet, Bars, Rods, Wire, Castings and manufactured Aluminum articles of all kinds. The company also call attention to their experience in working Aluminum as qualifying them to offer valuable advice and to furnish estimates upon the cost of manufacturing any article. The officers of the company are as follows: Jos. Gerharz, president; Horace S. Norton, vice-president; T. J. Huston, treasurer; J. C. Ashton, general manager; R. M. Shearer, secretary, and E. Doughman, superintendent.

Price-Lists, Circulars, &c.

LUDLOW-SAYLOR WIRE COMPANY, St. Louis, Mo.: Catalogue No. 21 showing a full and complete line of Counter and Office Railings, Wickets and Window Guards. The catalogue contains samples of work recently done by them, of which the interior views of the Chemical National Bank, St. Louis, Mo., and St. Louis Safe Deposit Company, are particularly attractive. The former is finished in Japanese bronze, while in the latter oxidized copper has been chosen. Their line of Office Railings and Polished

Brass Wickets is full and complete, and a number of attractive designs are shown. Three pages are devoted to Iron Window Gratings, which, with their facilities, they are able to produce in large quantities. The catalogue is printed with blue ink on a good quality of paper.

THE BUHL STAMPING COMPANY, Detroit, Mich.: Condensed price-list of Factory and Railroad Milk Cans and Dairy Can Supplies. This pamphlet, No. 16, under date October 15, 1892, illustrates and describes the goods to which it is devoted.

M. B. SCHENCK & Co., Meriden, Conn., and William H. Jacobus, 90 Chambers street, New York: Yale and Gem Casters. These goods are illustrated with prices in various styles and sizes. For the convenience of the trade a list is given showing corresponding sizes and numbers as nearly as possible of Yale and Martin Casters.

AMES SWORD COMPANY, Chicopee, Mass.: Perfection Padlocks and other Hardware. An illustrated catalogue devoted to these goods shows Dog and Cat Padlocks, Perfection Key Holders, Trusty Key Holders, Key Guard Chains, Perfection Padlocks, Baggage Protectors, Bicycle Padlocks, Cast Bronze Padlocks, &c.

THE WILLIAM CABBLE EXCELSIOR WIRE MFG. COMPANY, New York: Superior Fourdrinier Wires, Cylinder Molds, Dandy Rolls and all kinds of Copper, Brass and Iron Wire Cloth, Copper, Brass and Iron Wire, Riddles. Coal and Sand Screens, Plain and Ornamental Wire Work, Wire Window Screens and Guards, Office and Bank Railing, Grilles, Wire Rope, &c. The company state that nothing but the very best articles in their respective lines will be sent from their establishment.

KOHLER, HAYSSEN & STEHN MFG. COMPANY, Sheboygan, Wis.: Flint Ware. A line of Flint-Enameled Stamped Steel Ware is shown, also Cast Iron Enameled Stove Ware, Reservoirs, Maslin Kettles, and Cuspidors, Sinks, Drip Trays, and other Sanitary Ware; also Evaporating Dishes and Caldrons for chemical uses. The illustrations of the Flint-Enameled Steel Ware are colored to represent the appearance of the goods.

READING HARDWARE COMPANY, Reading, Pa., New York, Philadelphia and Chicago: Illustrated supplementary sheets of La Grande, Americus, Ribbon and Colonial designs of Bronze Metal Hardware. Each design is shown in three articles—Escutcheon with knob, Plate for Extension Flush Bolt and Electric Push Button, the two latter being shown full size The sheets, fastened together by a cord at the top, are 9½ x 12 inches in size, of heavy colored cardboard Each design and accompanying price list are printed on different colored sheets, forming a highly artistic and convenient arrangement for presenting these goods, which are of elaborate and pleasing designs.

TIE COMPANY, Unadilla, N. Y.: The Holdfast Tie. These are designed for tying glove laces, papers and parcels, horses' tails, bags, corn, ensilage, tennis nets, tent ropes, truckmen's binding rope, clothes lines, hammocks, &c.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Drawing the line at lower cost of Pig Lead and some depreciation in market value of Block Chalk, there is no distinctly new feature to note in the market for base materials that enter into the manufacture of Paints and allied goods. The fall in price of the commodities specified has, for that matter, had no perceptible influence upon the market for the products thereof, and it goes without the saying that, such as they may be, the reductions in cost have accrued almost wholly to the manufacturers of Pigments, Whiting and Putty. In this connection it may also be noted that manufacturers of Oxide Zinc find something to their advantage in a fall in the price of Zinc Ores, due to increase in production of the Ores latterly; but the Oxide manufacturers, like the Lead corroders and the manufacturers of Whiting and Putty, seem to be more concerned about their own advantages than in the philanthropic measure of immediately turning favorable circumstances to the benefit of their customers. In any event, no changes are announced in prices of the manufactured goods, and price "cutting" is discovered only in the instance of second quality goods or those that stand higher in representation than in intrinsic merit. As to business, reports have been somewhat variable, but it would appear to be a fair deduction from the general run of accounts that distribution all along the line is running fully up to the average for the season.

White Lead.—The fact that the price of Pig Lead has dropped to 4¢ ℔ lb, and that market conditions are against any considerable reaction in the immediate future naturally causes buyers who follow trade influences closely to look for some modification of list prices for White Lead by the combined corroders. Thus far, however, the combine has manifested no desire to share the profits of cheaper crude material with their customers. The list prices for White Lead remain the same as they were when Pig Lead was ¼¢ ℔ lb higher than it is at the present time. Some of the "quick process" manufacturers not identified with the combine are rather more liberal in their treatment of customers, as are also manufacturers of Mixed Leads, but even in those quarters the concessions made from prices that prevailed a month ago are remarkably small. This may appear rather peculiar to the ordinary observer, but inquiries as to the why and wherefore are rewarded by no more satisfactory explanation than that a satisfactory business is being done at present prices and that there is no cause for concessions.

Red Lead and Litharge.—The former line of prices for all grades prevails and, while not of remarkable volume, business appears to be fully up to the average for this season of the year. The same remarks would apply to Orange Mineral, foreign and domestic.

Zincs.—At a recent meeting, manufacturers of American Oxide decided to adhere to the list prices that have been in force for some considerable time past, despite the increased output of their product and lower cost of crude material. This attitude would, in a measure, seem to confirm the accuracy of the report that consumption has increased in proportion to production and that the manufacturers see more profit in concerted action than in free and indiscriminate competition. Foreign Zincs are sellingin a moderate way only, and the business passing is at the same line of prices that has prevailed for many weeks.

Colors, &c.—There is a very good trade in most lines of bulk goods used by grinders, and, while some little variation in prices occurs, the changes are too narrow to be of special significance. With values of other base materials also almost stationary, manufacturers of both Dry and Oil Colors, adapted for painters' use, adhere to their former line of prices. Business is of quite good volume for the season, not only in the lines specified, but in Ready Mixed Paints of the better class.

Miscellaneous.—Block Chalk has been sold at lower prices, or $1.65 ex steamer, and $1.80 to arrive by sail vessel. Those prices reflect full market value for large lots at the moment. Neither Whiting nor Putty have been visibly affected thus far by the lower prices for Chalk, but buyers are more inclined to hold off. Barytes, China Clay, Terra Alba, Talc, &c., are without radical movement in value, and meet with about routine sale.

Oils and Turpentine.

A further sharp rise in price of Lard Oil is about the only distinctly new feature to note for the week under review. There have been numerous reports of unfavorable prospects for a good crop of Cotton Seed, and consequently some disposition to look upon Cotton Seed Oils as being remarkably good property at present prices, yet, with this point in their favor, to say nothing of the further advance in prices of Lard and Lard Oil, values have not perceptibly appreciated. It is also remarkable that other Oils that usually follow in the wake of the market for Lard and inferior Greases remains almost stationary, and the surface appearances are that large operators are skeptical as to the endurance of the advance in hog products. While not particularly brisk in any department, business has been very good during the week; better, if anything, than in the preceding two weeks.

Linseed Oil.—City crushers hold firmly at the line of prices established some little time ago, and to all accounts no outside brands are offered from first hands at less than 42¢ for Raw. Jobbers who stocked up when the market prices were 3¢ @ 5¢ lower, have dealt out some Oil at figures below those named by crushers, but this cheap second-hand supply has become considerably reduced of late and the offering of the same is insignificant at the present time. As natural under such circumstances, business is momentarily rather slow, but the pressers appear quite confident that they will be in complete control in the not far distant future, since all signs go to show that consumption is fully up to the average for the season.

Lard Oil.—Moderate supply and high cost of raw material have caused city pressers to raise their price for prime Oil to 70¢ @ 72½¢. Out-of-town pressers offer comparatively little, if anything, at less than the inside rate named. While thus strong on the sellers' end of the line, the market is rather slow. Buyers look upon present prices as being artificially high and due solely to speculative manipulation of the Lard market. Their purchases are governed accordingly and the volume of business at present is below the average for this season of the year.

Cotton Seed Oil.—The movement in this line shows some increase as the season advances. Some large blocks of crude in tank cars have been taken at 21½¢ @ 22¢ in the South, chiefly for the account of Western consumers; upward of 2000 barrels New crude in barrels went at 27½¢; numerous parcels of prime Summer Yellow went at 30¢ @ 30½¢, and small lots of other refined at corresponding prices. The prices quoted differ in no marked degree from those that ruled a week ago, but the market is certainly more active and the undertone firmer.

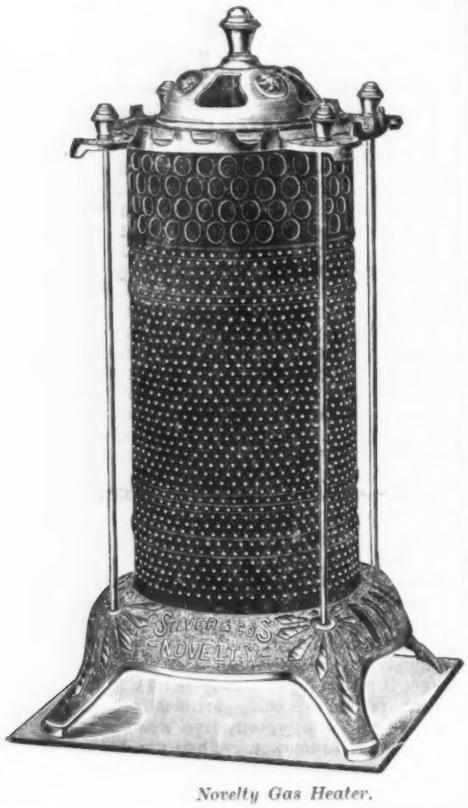
Fish Oils.—Business in Crude, Sperm, Whale and Menhaden Oils has been on a moderate scale, but such as they were, the dealings were at full former prices, showing a firm if rather quiet market. Refined products have moved out fairly in ordinary jobbing way at practically unchanged prices.

Miscellaneous.—No radical change has taken place in prices of Olive, Cocoanut or Palm Oils, and neither business or demand have exceeded ordinary proportions.

Spirits Turpentine.—Buyers have taken hold in a somewhat spasmodic manner, but the volume of business makes a better showing than that of several weeks past and prices have advanced to 30¢ for regular and 30½¢ for machine barrels.

Novelty Gas Heater.

Silver & Co., 56 Warren street, New York, are introducing this heater, as illustrated herewith. It has a cast-iron base and top of attractive pattern, nicely nickel plated, held together by long rods. The cylinder of the heater is of perforated iron, inside of which is a ruby glass globe, there being an air space between the cylinder and the globe. A radiator, a part of the cast-iron top, extends down into the cylinder to near the top of the globe, and ends at the top of the small perforations in the cylinder. The base is provided with a perforated tin bottom with a swing slide through which the heater is lighted, and a short iron tube over which the rubber tube is slipped, thus connecting it with the supply of gas. The iron tube has a stop cock for regulating the amount



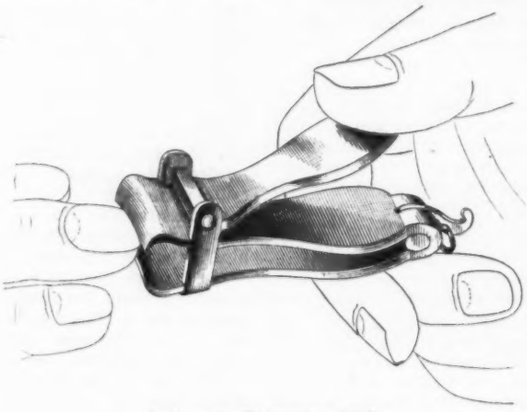
Novelty Gas Heater.

of gas supplied. In use the coldest air is made the hottest by passing it from near the floor up through the perforations at the sides and bottom of the stove and then through the radiator, which becomes red hot, after which the superheated air is passed out through the large openings at the top of the cylinder, creating a circulation in the room. When the heater is burning the ruby globe in combination with the perforated cylinder gives the stove a cheerful and attractive appearance, making a desirable addition to parlors, sitting rooms, offices, and both large and small rooms. The general make-up of the heater is referred to by the manufacturers as being of a high class, and the construction as an entirely new departure, insuring a great saving of fuel. The heaters are made in three sizes, small, medium and large, being 15, 20 and 26 inches in hight and consuming at moderate pressure from 3 to 20 feet of gas an hour. Any of the heaters, it is stated, will burn with a bright and cheerful appearance with a consumption of only 2 feet per hour.

Fifty-four molders employed at the Pitts Agricultural Works, Buffalo, quit work because the company introduced a new automatic time recorder.

A New Nail Trimmer.

J. Curley & Bro., importers and dealers in fine cutlery and optical goods, 6 Warren street, New York, are introducing a manicure novelty for cutting finger nails, as shown, which may be carried or suspended from the chain as a charm by means of a split steel ring attached to it. The trimmer is less than 1½ inches long, and not quite ½ ounce in weight. Both sides are made of one piece of steel, which is formed over a wire pin at one end to give it spring action, the jaws then opening automatically when the lever or thumb piece is released from the hook provided to keep the parts compactly together when not in use. In operation the implement is put in contact with the nail to be trimmed and with a pressure of the thumb and finger of the other hand the circular cutting edges are forced together by the motion of the eccentric, which is held in position by the shackle and rivet seen in the cut. The article is well made of a high grade of cut-



Cutter for Trimming Nails.

lery steel, highly polished or nickeled, and is referred to as especially useful where children are to be treated.

Columbian Joist Leveler.

The Columbian Mfg. Company, Cincinnati, Ohio, are introducing this device

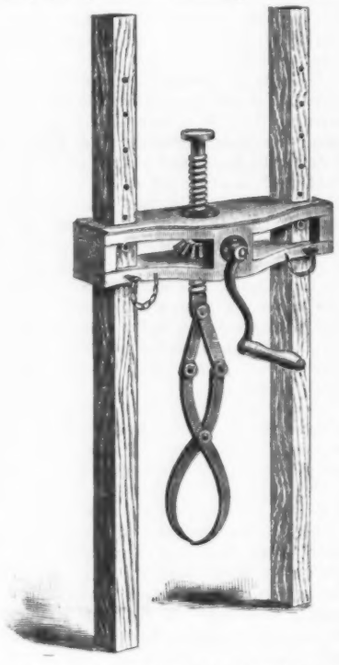


Fig. 1.—Columbian Joist Leveler.

as illustrated in Fig. 1. The apparatus consists of two hardwood uprights 3 feet long by 1½ inches thick; the upper half of each being supplied with perforations 2 inches apart from center to center, in which are inserted wrought-iron pins or

Fig. 2.—Application of the Joist Leveler.

dowels to hold the crosshead frame at the proper elevation for leveling the joist. The crosshead frame measures 15½ inches from out to out by 4½ inches in hight, through the center of which a triple-thread screw, 12 inches long and 1 inch in diameter passes. The screw has attached to its lower end toggle jointed tongs. At the center of the frame the screw also passes through a bevel geared collar; the geared collar in turn engaging a like gear attachment to, and operated by a crank. A groove in the entire length of the screw and a corresponding tongue in the lower bushing which is inserted in the bottom of frame prevent the screw from turning while the crank is being operated.

The leveler is intended for rapidly and easily adjusting or leveling joists, beams and girders properly while the building is in course of erection, as shown in Fig. 2.

The makers claim that with this machine a boy can do the work of two or three men in leveling the lightest or heaviest joists, beams and girders in less than half the time and much more easily than by the old method; that the joist once in the grasp of the tongs cannot slip, and that the apparatus while in use will not fall, as the weight of the joist keeps it upright at all times until the latter is released.

The leveler is referred to as being well put together, light and durable and inexpensive; its cost being readily saved in the first building where it may be used.

The Pike Mfg. Company, Pike Station, N. H., in their page advertisement refer to their well-known Indian Pond Scythe Stone, which it is stated has been on the market for 69 years. Among the company's other Scythe Stones, the excellent sharpening qualities of which are referred to, are the following: The Black Diamond, the Lamoille, the Premium Quinnebog, the Willoughby Lake and the Green Mountain.

Clothes-Line and Wagon Hooks.

Walter A. Perry & Co., New Bedford, Mass., are offering these hooks to the trade, as illustrated herewith. In use the rope is drawn around the hook, down through the wedge-shaped opening to hold the tension, then up over the back cleat, making the final fastening by drawing the rope down through the wedge-shaped opening again.

Fig. 1.—Horseshoe Clothes-Line Hook.

The manufacturers state that the hooks are made of the best quality of air furnace refined malleable iron, and being perfectly finished have no rough or sharp edges to cut the line. The plate of the wagon hook is cast without holes, so that they may be bored to fit any wagon sill. The point is made that the important feature in the wagon hook is the saving of all tension of the line drawn around the hook, allowing no slack from the motion of the load. The hooks are designed to do away with the bother of tying knots, make a secure fastening, at the same time be practical and useful, and to compete favorably with the common hooks on the market, and allow the retailer a good profit. Each hook is made in three sizes; also a hook for hammocks in which the same features are embodied.

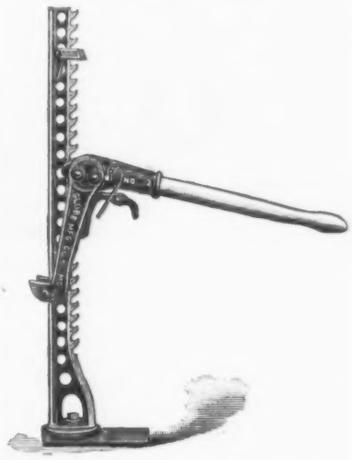
Fig. 2.—Wagon Hook.

Burton's Hercules Lifting Jack.

Globe Mfg. Company, corner Eighth and Mulberry streets, Kansas City, Mo., are putting on the market the jack shown in the accompanying cut. It is made of the best quality malleable iron and steel, the shaft being bolted to the base in such a manner as to revolve. The manufacturers state that each movement of the lever either up or down raises the load 1 inch, and that the load can be lowered in the same manner that it is raised, with little exertion and with absolute safety.

To lift a load perpendicular, the staff is revolved so that the long end of the base comes under the load and braces the staff, but if it is wished to raise an object with one end resting on the ground, the staff is turned with the short end of the base toward the load, and this position allows the jack to get close to the work and tip as the object rises and adjust itself to the load. This feature is referred to as making the jack a valuable help about saw mills for raising the ends of logs to put skids under and about warehouses where heavy boxes, machinery and implements have to be moved.

It is explained that in this jack the dog works entirely independent of the handle, except that it is fastened to the handle by a steel bearing pin, but its motion in raising a load is controlled by gravity alone. When the handle is raised the dog follows until it passes the point of the tooth, when it drops into the tooth by its own weight. There is, however, a movable pin passing through the handle of the dog to assist in lowering the load. In raising the load this pin must be pushed through the handle of the dog so that it will clear the wire spring shown in the cut. When the load has reached the desired hight and it is desired to let it down, the cotter pin which holds the small casting that is attached to the upper part of the staff is pulled out. This casting is called the twin wedges, one working on each side of the staff and connected together, and when the casting is released it drops down behind the ends of the handle and is in position to do its part of the work. The movable pin in the dog handle is now pushed behind the wire spring. If the operator now bear down upon the handle, throwing the entire load on the dog, it carries the main bearing pin toward him far enough to pass the point of the tooth below, and the twin wedges drop behind the ends of the iron part of the handle and hold the pin in that position. The handle is then raised and the main bearing pin passes the point of the tooth, and as he continues raising the handle it enters the tooth below and takes the load, releasing the dog, which is immediately thrown out by the wire spring, and lowering the handle, the dog enters the next tooth below and in its turn takes the load, and so on, lowering the load one tooth at a time. There is also an attachment not shown in the cut that slides over the staff above the hooks, to reach an object that is too high to reach with the hooks, which is furnished when desired, and for which an extra charge is made. It is claimed by the makers that their No. 2 jack, intended for ordinary purposes, while weighing less than 20 pounds, will handle 2500 to 3000 pounds; and, if fairly used, should last a lifetime. The jacks are also recommended for handling hay presses, and are claimed by the manufacturers as being light, fast and powerful in comparison with their weight.



Burton's Hercules Lifting Jack.

A Dredging Rake.

W. J. Clark & Co., Salem, Ohio, recently made for the Missouri Dredging & Transporting Company, St. Louis, Mo., rakes as illustrated herewith. The teeth of the rake are held in place by a square hole in a forward turned flange, and are fastened to the front surface of the head by one bolt only. By this arrangement a broken tooth can be quickly removed and another put in its place, instead of the rake being forged in one piece, making it expensive and difficult to repair. The rakes are attached to chains by bolts through the backward turned flange at the ends of rake head, the latter being made of heavy plate iron. The rakes are designed to be used in connection with elevator buckets operated by endless chains on dredging machines, one rake to every four or five buckets. The work of the rakes is to loosen bolwders and grapple snags, &c., while the buckets scoop the loosened stones or mud and carry them to the dredge boat.

A Dredging Rake.

Ever-Ready Blanket Strap.

Covert's Saddlery Works, Farmer, N. Y., are introducing the strap shown with the blanket ready for snapping in the rings on the opposite side, and making a tail cord unnecessary. The makers suggest that they may be easily changed from

Fig. 1.—Ever-Ready Blanket Strap.

in the accompanying cuts. The manufacturers state that the straps are made of a good quality harness leather, either russett or black, and are furnished all ready for attaching to the blanket, which can be done either with rivets or by stitching. These straps are designed to take the place of a surcingle, and are referred to as having advantages over it that make them popular with horsemen. With these straps, it is stated, the blanket is held securely in its place and at the same time is loosely girted to the horse, making it more comfortable for the animal and lessening the strain on the blanket, thus increasing its durability. The point is made that they are more convenient than the surcingle, being always a worn out blanket to a new one, as they will wear a long time.

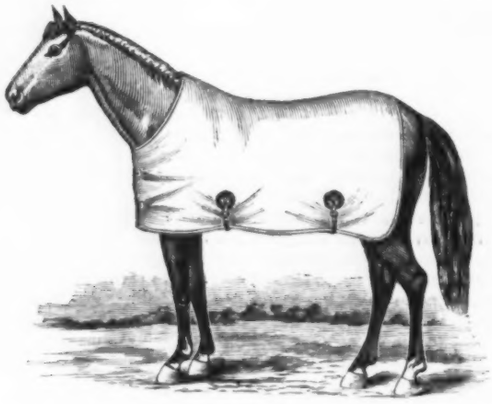


Fig. 2.—Ever Ready Straps Attached.

The Electric Parer and Slicer.

Augusta Machine Works, Augusta, Maine, are introducing this article, as shown in the accompanying illustrations. It consists of a steel blade attached to a conveniently shaped handle, the blade being of a good quality steel that may be resharpened. The shape of the blade is referred to by the makers as being such as to enable it to follow a curved or uneven surface as well as a straight one, and to take off a thin, even paring. The sharp corner and edges are designed for removing the eyes and decayed parts of vegetables quickly. The point is made that the tool cuts slices of uniform thickness, and that it pays for itself by saving time, trouble and waste of vegetables. The Electric is designed for paring potatoes, apples, pears, quinces, carrots, parsnips, turnips, squashes, &c.

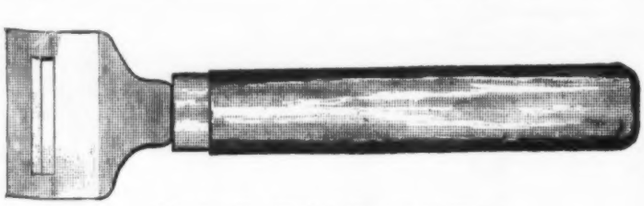


Fig. 1.—The Electric Parer and Slicer.

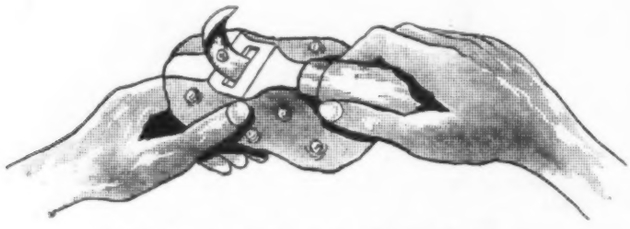


Fig. 2.—Application of the Parer and Slicer.

CONTENTS.

PAGE.

Electric Motors in a Machine Shop. Illustrated ... 711
The Reagan Injector. Illustrated ... 714
Metal-Cutting Tools.—VII ... 715
The Kenderdine System of Burning Crude Oil. Illustrated ... 717
Geared Electric Hoists. Illustrated ... 718
The Elimination of Sulphur from Iron ... 719
Cost of Iron Ore Carriage ... 721
Power Transmission in High Buildings. Illustrated ... 722
Troops Removed from Homestead ... 723
The Indiana Gas Region ... 724
Power Punching Press. Illustrated ... 725
The Green Engine Governor. Illustrated ... 726
World's Fair Notes ... 727
The Edenborn Rod Reel. Illustrated ... 728
The Curtis Pipe Cutting and Threading Machine. Illustrated ... 729
The Mining Engineers ... 730
Pullman's Palace Car Company ... 733
The Week ... 734
Personal ... 734
Editorials:
Chicago's Industrial Growth ... 735
Sources of Prosperity ... 735
The Approaching Homestead Victory ... 736
Western Freight Prospects ... 736
Correspondence ... 736
Mahoning Valley Interests ... 738
Washington News ... 738
Obituary ... 739
Hello, Chicago ... 739
The Meeting of the Finishers ... 739
Extension of the Brooklyn Elevated Railroad ... 739
Valley News ... 740
The Anaconda to be Stopped ... 740
Manufacturing:
Iron and Steel ... 740
Machinery ... 741
Hardware ... 742
Trade Report:
Philadelphia ... 742
Chicago ... 743
Louisville ... 744
Pittsburgh ... 744
Detroit ... 746
St. Louis ... 746
Cleveland ... 746
Cincinnati ... 747
New York ... 747
Metal Market ... 747
British Iron and Metal Markets ... 748
Hardware:
Condition of Business ... 749
Notes on Prices ... 751
Letter From Polhemus Lyon ... 753
St. Joseph Pump Company ... 753
Manning, Bowman & Co ... 754
Craig Sivier ... 754
Trade Items ... 754
Price-Lists, Circulars, &c ... 754
Paints and Colors ... 755
Novelty Gas Heater. Illustrated ... 756
A New Nail Trimmer. Illustrated ... 756
Columbian Joist Leveler. Illustrated ... 756
Clothes Line and Wagon Hooks. Illustrated. 757
Burton's Hercules Lifting Jack. Illustrated. 757
A Dredging Rake. Illustrated ... 757
Ever-Ready Blanket Strap. Illustrated ... 758
The Electric Parer and Slicer. Illustrated. 758
Current Hardware Prices ... 759
Current Metal Prices ... 766

Current Hardware Prices.

OCTOBER 19, 1892.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....℔ doz $3.00, 33⅓%
Excelsior....℔ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c*

Anvils—

Eagle Anvils, ℔ ℔ 10¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand..11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher) 75%
P. S. & W. Co.
Rockford Bit Company.
Cook's, Douglass Mfg. Co.....55%
Cook's, N. H. Copper Co.....60%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32⅛ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&10%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
Car Bits.....60@60&10
Car Bits, P. S. & W. Co.....60&10
Snell's Car Bits.....60%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ℔ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48,.....20%

Gimlet Bits—

Common.....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.25.....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ℔ gro.....$5.25%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives'
French, Swift & Co. 33⅓@33⅓ & 10%
Douglass'
Bonney's Adjustable, ℔ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....℔ gr. 85¢@90¢
Awls, Should. Peg.....℔ gr. $1.50@$1.55
Awls, Pat. Peg.....℔ gr. 35¢@38¢
Awls, Shouldered Brad..℔ gr. $1.30@ 1.40
Awls, Handled Brad....℔ gr. $2.50@$3.00
Awls, Handled Scratch..℔ gr. $4.00@4.50
Awls, Socket Scratch..℔ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.		Beveled.
First quality, best brands	$7.00	@	$7.50
First qual., other brands	6.50	@	7.00
	6.75	@	
Second quality	5.50		6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3¼¢@4¼¢. No. 2, 5¢@6¢
Nos. 7 to 14.....60&10% 3¢ cash
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
National Tubular Self Oiling.....33⅓%@33⅓&5%

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

	No. 3000	20	30
Chatillon, ℔ doz.	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....℔ ℔ 3½¢
Iron, Steel Points.....℔ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10¼ inch, $2; 12-inch, $2.25 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....℔ doz $1.20@$7.50
Duplex (Standard Co.).....℔ doz $1.25
Rival (Standard Co.).....℔ doz $1.00
Duplex Extra Heavy (Standard Co.)....℔ doz. $3.50
Bryant's.....℔ gross $14.00
Double (H. & R. Mfg. Co.), ℔ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$30.00
Easy (H. & R. Mfg. Co.).....℔ gro $12.00
Triple (H. & R. Mfg. Co.).....℔ gro $16.50
Spiral.....℔ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)....℔ gro. $9.00
Paine, Diehl & Co.'s.....℔ gro. $24.00
Silver & Co.....℔ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%

Hand—

Light Brass.....70&10%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous

Call.....40@40&5%
Farm Bells.....℔ ℔ 3¢@3¾¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10@60&10&5%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@10@75&5%
Standard.....70&5@70&10%
Extra.....60&10@60&10&5%
N.Y.B.&P. Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron.50@50&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5&2%
Genuine Eagle, Norway, list Oct. '84.....80@80&10%
Phila. pattern, list Oct. 7, '84..75&10@80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80@80&5%
Bolt Ends, list Jan. 1, 1890.....75&10@75&10&5%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's...60&10%
Wr't Shutter, Brass Knob.....40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B. K.Flush, Co' mr.....55&10%

Stove and Plow—

Stove.....60@60&10%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '85.....65%
R. B. & W., Philadel., list Oct. 16, '84...80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&30%
Clark's.....33⅓&35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....2¾¢

Braces—

American Bit Brace Co.
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Ball Braces, net.....$1.12 to$1.25
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's,
Nos. 10 to 16.....50@50&10%
Nos. 30 to 33.....50@50&10%
Nos. 40 to 63.....50&10@50&10&5%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....66⅔@66⅔&10%
Shelf, fancy,
Sargent's list.....66⅔@66⅔&10%
Other makes at a wide range of prices.

Bright Wire Goods—See *Wire.*

Broilers—

	Inch.....	9	10	9x11
Henis' Self-Basting.	Per doz...	$4.50	5.50	6.50
New Haven.....				50%
Wire Goods Co.....				65&10%
Morgan Odorless.....		℔ doz.	$12,	33⅓%

Buckets, Well—

Galvanized—

Hill's.....℔ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....℔ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....℔ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers, Butchers'.*

Butts—

Brass—

Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts..... .75@75 &10%
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips..

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad..... .75@75 &10%
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Indide Blind, Light.....
Loose Pin.....
Bronzed Wrought Butts. .....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7¼@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See *Openers, Can.*

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co. ℔ 1000
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's....47@50¢
Musket, Waterproof, 1-10's.....50@53¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@58¢
Eley's D Waterproof, Central Fire..$1.60

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

Carpet Stretchers—See *Stretchers, Carpet.*

Carpet Sweepers—See *Sweepers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Casters—

Bed.....
Plate..... Brass.....55@55&10%
Shallow Socket..... Others....60@60&10%
Deep Socket.....40&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Martin's Patent (Phœnix).45&10@50&10%
Payson's Anti-friction.....70%
Payson's Truck.....60%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%
Gwinner's Common Sense.....50%
Gwinner's Hercules.....50%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ℔ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised April 21, 1890...60@60&10%

American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.25

Less than cask lots, add¼¢@½¢ ℔ ℔
German Coil, list July 12, 1892..60@60&5%
German Halter Chain, list July 12, 1892. 60@60&5%
Covert Halter.....60&2%
Covert Traces.....35&2%
Covert Heel Chain.....50&2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....℔ ℔ 5½@6¢
Jack Chain, Iron.....80&10%
Jack Chain, Brass.....80%

Chalk—

White, case lots. ℔ gr 50¢; small lots 55 @ 56¢
Red, case lots....℔ gr 67¢; small lots 77 @ 78¢
Blue, case lots....℔ gr 75¢; small lots 85¢
See also Crayons

Chalk Lines—See *Lines*

Chisels—

Socket Framing and Firmer

P. S. & W
New Haven
Witherby
Mix
Ohio Tool Co. ..... .75&5@75&10&5%
Douglass ..... 75@75&5%
Buck Bros. 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 30@30&5%

Tanged and Miscellaneous.

Tanged Firmers ..... 40&10@50%
Butchers' ..... $4.75@$5.00
Spear & Jackson's ..... $5 to £
Buck Bros 30%
Cold Chisels, ℔ lb ..... 15@10%

Chucks—

Beach Pat. ..... each, $8.00 ..... 20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Balz Pat. 25%
Graham Patent 33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns—

Tiffin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—

R. I. Tool Co.'s Wrought Iron 25%
Adjustable, Cincinnati ..... 15&10%
Adjustable, Hammers ..... 15@15&5%
Adjustable, Stearn's ..... 30@30&10%
Stearn's Adjustable Cabinet and Corner ..... 30@30&10%
Cabinet, Sargent's ..... 66⅔&10%
Carriage Makers', Sargent's ..... 70&10%
Carriage Makers', P., S. & W Co. ..40&10%
Eberhard Mfg. Co. ..... 40&5@40&10%
Warner's ..... 40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati ..... 25&10%

Cleavers, Butchers'—

Bradley s ..... 25@30%
L. & I. J. White ..... 20&5%
Beatty's ..... 40@40&5%
New Haven Edge Tool Co.'s 40%
P., S. & W ..... 33⅓&5@33⅓&10%
Foster Bros 30%
Schulte, Lohoff & Co ..... 40@40&5%

Clips—

Norway, Axle, ¼ & 5-16 ..... 55&5&5%
2d grade Norway Axle, ¼ & 5-16 ... 65&5%
Superior Axle Clips ..... 66⅔&5@70%
Norway Spring Bar Clips, 5-16 ..60@5&5%
Wrought Iron Felloe Clips ..... ℔ lb., 5½¢
Steel Felloe Clips ..... ℔ lb, 5¢
Baker Axle Clips 25%

Cloth and Netting, Wire

—See *Wire, &c.*

Cockeyes 50%

Cocks, Brass—

Hardware list ..... 60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Chapman Mfg. Company ..... 50&10@60%
Medford Fancy Goods Co. ..... 40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list 40%
Brass, Pope & Steven's list 40%

Combs, Curry—

Fitch's ..... 50&10@50&10&10%
Rubber, per doz., $10.00 ..... 25%
American Curry Comb Co. ..... 33⅓@40%

Compasses, Dividers, &c.

Compasses, Calipers, Dividers. 70@70&10%
Bemis & Call Co.'s
Dividers ..... 60&5%
Compasses and Calipers ..... 50&5%
Wing and Inside or Outside ..... 50&5%
Double 60%
Call's Patent Inside 30%
Excelsior 50%
J. Stevens & Co.'s ..... 25&10%
Starrett's
Spring Calipers and Dividers ..... 25&10%
Lock Calipers and Dividers 25%
Combination Dividers 25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—

Sash—

Common ..... ℔ lb., 10@11¢
Patent, good quality ..... ℔ lb., 12@12½¢
White Cotton Braided, fair, ℔ lb., 24½@25¢
Common Russia Sash ..... ℔ lb., 12½@13¢
Patent Russia Sash ..... ℔ lb., 14¢
Cable Laid Italian Sash ..... ℔ lb., 21@22¢
India Cable Laid Sash ..... ℔ lb., 12¢
Silver Lake—
A quality, White, 50¢ 25%
A quality, Drab, 55¢ 25%
B quality, White, 30¢ 10%
B quality, Drab, 35¢ 10%
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab, 30¢
Semper Idem, Braided, White ....27@28¢
Egyptian, India Hemp, Braided ..... 26¢
Massachusetts, White ..... 26¢
Samson—
Braided, White Cotton, 50¢. 30@30&5%
Braided, Drab Cotton, 55¢. . 30@30&5%
Braided, Italian Hemp, 55¢. . 30@30&5%
Braided, Linen, 80¢ ..... 30@30&5%
Tate's Cotton Braided, White, ℔ lb., 28¢.10%
Ossawan Mills—
Braided, Giant, White, ℔ lb., 30¢....20%
Braided, Giant, Drab and Fancy, ℔ lb., 35¢ 10%
Braided, Crown, White, ℔ lb., 50¢...50%
Braided, Crown, Drab and Fancy, ℔ lb 55¢ ..... .30%

Wire Picture—

Braided or Twisted ..... 80@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters

—See *Knives, Corn.*

Crackers, Nut—

Table (H. & B. Mfg. Co) 40%
Blake's Pattern, ℔ doz., $2.00 ..... 10%
Turner & Seymour Mfg. Co. 50%
Acme, ℔ gross $30
Japanned 50%
Nickel Plated 10%

Cradles—

Grain ..... 50&5&2@50&10&2%

Crayons—

White Crayons, ℔ gross ..... 10¢
D. M. Stewart Mfg. Co., Metal Workers', ℔ gross, $2.50 ..... 25%
D. M. Stewart Mfg. Co., Rolling Mill, ℔ gross, $2.50 ..... 25%
See also *Chalk.*

Crow Bars—See *Bars, Crow.*

Curry Combs—

See *Combs, Curry.*

Curtain Pins—

See *Pins, Curtain.*

Cutters—

Meat—

Dixon's, ℔ doz ..... 40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's, ℔ doz ..... 40&5%

Nos.	100	150
	$15.00	$18.00

Hale's Pattern, ℔ doz ..... 70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American 30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$80

Enterprise 30%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Great American Meat Cutter ..30@30&5%

Nos.	112	116	118	120	122
Each	$2.00	$2.75	$3.00	$3.50	$4.00

Miles' Challenge, ℔ doz ..... 45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1, ℔ doz., $26.00 ..... 55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

Beef Shavers (Enterprise) ..... 20&10@30%
Little Giant (P. S. & W. Co.) 50%
Chadborn's Smoked Beef Cutter, ℔ doz., $66.00

Tobacco

Champion ..... 20&10@30%
All Iron ..... ℔ doz., $4.25
Nashua Lock Co.'s.. ℔ doz., $18.00, 50@55%
Wilson's 55%
Sargent's ..... ℔ doz., $24.00, 55&10
Acme ..... ℔ doz., $20.00, 40%

Washer—

Smith's Pat. ..... ℔ doz., $12.00, 20&10&10%
Johnson's ..... ℔ doz., $11.00, 33⅓%
Penny's.. ℔ doz.,, Pol. $14 ; Jap'd, $16, 55%
Appleton's ..... ℔ doz., $16.00, 60&10%
Bonney's ..... 30&10%
Cincinnati ..... 25&10%

Dampers, &c.—

Dampers, Buffalo ..... 40&10%
Buffalo Damper Clips ..... 40&10%
Crown Damper 40%
Excelsior ..... 40&10%

Diggers, Post Hole, &c.—

Samson post Hole Digger, ℔ doz., $36.00 25%
Fletcher Post Hole Augers, ℔ doz., $36.00, 20%
Eureka Diggers.... ℔ doz., $11.50@$12.50
Leed's ..... ℔ doz., $8.00@$9.00
Vaughan's Post Hole Auger, ℔ doz., $8.50@$9.50
Kohler's Little Giant ..... ℔ doz., $18.00
Kohler's Hercules ..... ℔ doz., $15.00
Kohler's New Champion.... ℔ doz., $9.00
Scheidler ..... ℔ doz., $18.00
Ryan's Post Hole Diggers.. ℔ doz., $24.00
Cronk's Post Bars, ℔ doz., $60.00, 50&5@50&10%
Gibb's Post Hole Digger..... ℔ doz.,$15.00
Imperial ..... ℔ doz., $15.00
Shimer's Hollow Handle.. ℔ doz.. $24.00, 50%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Springs—

See *Springs, Door.*

Drawers.

Money, ℔ doz ..... $18@$20

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Blacksmiths' ..... each $1.75
Blacksmiths Self-Feeding, each $7.50, 20%
Breast, P. S. & W ..... 40&10%
Breast, Wilson's ..... 30&5%
Breast, Millers Falls ..... each $3.00, 25%
Breast, Bartholomew's.... each $2.50 25&10@40%
Ratchet, Merrill's ..... 20@20&5%
Ratchet, Ingersoll's 25%
Ratchet, Parker's ..... 20@20&5%
Ratchet, Whitney's ..... 20&10%
Ratchet, Weston's ..... 20@25%
Ratchet, Moore's Triple Action.... 25@30%
Ratchet, Curtis & Curtis 30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 ..... 20&10%
Wilson's Drill Stocks 10%
Automatic Boring Tools ..... $1.75@$1.85
Chicopee Automatic Drill ..... 20&10%

Twist Drills—

Cleveland ..... 50&10&5%
Diamond, W. & B ..... 50&10&5%
Graham's Pat. Groove Shank.. 50&10&5%
Morse ..... 50&10&5%
New Process ..... 50&10&5%
Standard ..... 50&10&5%
Syracuse (Meta list) ..... &10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—

See *Pans, Dripping.*

Drivers, Screw—

Douglass Mfg. Co. ..... 20@20&10%
Disston's 50%
Buck Bros. 30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles ..... 65&10%
No. 86 ..... 70&10%
Sargent & Co.'s
No. 1, Forged Blade ..... 60&10&10%
Nos. 20, 40 and 60 ..... 66⅔&10&10%
P. S. & W 70%
Knapp & Cowles
No. 1 ..... 60&20@70%
No. 2 ..... 60&10&10@70&5%
No. 3 ..... 60&5@60&10%
Nos. 4 and 00, Acme and Ideal... 50&5@50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat. ..... 30@33⅓%
Crawford's Adjustable 30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense.. ℔ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits.....30&30&5%
Screw Driver Bits ..... ℔ doz., 50@75¢
Screw Driver Bits, Parr's.. ℔ gross, $6.25
Fray's Hol. H'dle Sets...No. 3, $12.00, 45%
P. D. & Co.'s All Steel 50%
Cincinnati ..... 25&10%
Brace Screw Drivers ..... 25&10%
Buck Bros.' Screw Driver Bits....27½&5%
Goodell's Automatic 50%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 45&10%

Egg Beaters—See *Beaters, Egg.*

Egg Poachers—

See *Poachers, Egg.*

Electric Bell Sets—

See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.FF.
Kegs, ℔ lb	4½¢	5 ¢	2½¢
½ kegs, ℔ lb	4½¢	5½¢	2¾¢
¼ kegs, ℔ lb	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—

See *Pins, Escutcheon.*

Escutcheons—

Door Lock....Same dis. as Door Locks.
Brass Thread ..... 60@60&10%
Wood 25%

Expanded Metal—

List No. 5.

Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Mackrell's, ℔ doz., $1.00 ..... 20@20&10%
Van Sand's Screw Pat, $15 ℔ gr.. 60&10%
Van Sand's Old Pat., $15 ℔ gr.....55&10%
Austin & Eddy No. 2008 ..... ℔ gr., $9.00
Security Gravity ..... ℔ gr., $9.00
Zimmerman's 45%

Faucets—

Fenn's 40%
Bohren's Pat. Rubber Ball 25%
Fenn's Cork Stops 33⅓%
Star 60%
Frary's Pat. Petroleum 60%
B. & L. B. Co.
West's Lock, Open and Shut Key 50%
Star, Metal Plug, new list 40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined ....60&10@ 60&10&10%
Cork Lined ..... 70&5@70&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots....50&10%
John Sommers'
Peerless Best Block Tin Key 40%
IXL, 1st quality, Cork Lined 50%
Diamond Lock 40%
Perfection, Fla. Red Cedar 50%
Goodenough Cedar 50%
Boss Metallic Key 50%
Reliable Cork Lined 60%
Western Pattern Cork Lined 50%
Self Measuring
Enterprise, ℔ doz., $36.00 ..... 20&10%
Lane's ℔ doz.. $36.00 ..... 25&10%
Victor ..... ℔ doz., $36.00 25&10%

Felloe Plates—

See *Plates, Felloe.*

Fifth Wheels—

Derby and Cincinnati ..... 45&5%
Brewster ..... 50&5%

Files—

Domestic—

Nicholson Files, Rasps, &c....60&10@ 60&10&5%
Nicholson (X.F.) Files 25%
Nicholson's Royal Files (Seconds)....75% (extra prices on certain sizes.)
American ..... 60&10&5@60&10&10%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade ..... 60&10@60&10&10%
Eagle ..... 60&10&5@60&10&10%
Other makers, best brands, 60&10@60&20%
Fair brands ..... 60&10&10@70&5%
Second quality ..... 70&10@75&10%
Heller's Horse Rasps ..... 50&7½@50&10%
McCaffrey's Horse Rasps ..... 50&10%
Chelsea Horse Rasps, Hand Cut ..50&10%
Arcade Horse Rasps ..... 60&10%

Imported—

Butcher ..... Butcher's list, 20%
Stubs ..... Stubs list, 25@30%

Fixtures, Grindstone—

Sargent's Patent ..... 70&10%
Reading Hardware Co. ..... 30&10%
P., S. & W. Co. ..... 50&10%

Fluting Machines—

See *Machines, Fluting.*

Fluting Scissors—

See *Scissors, Fluting.*

Fodder Squeezers—

See *Squeezers, Fodder.*

Forks—

Hay, Manure, &c....Asso. List, 70@70&5%
Hay, Manure, &c., Phila. List, 60@60&10%
Plated, see Spoons.

Frames—

Saw—

White Vermont ..... ℔ gro., $9.00@$10.00
Red, Polished and Varnished.... ℔ doz., $1.50, 25%

Screen, Window and Door—

Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons....33⅓@ 33⅓&10%
Stearns' Frames and Corners. 25@25&10%
Cortland ..... 40@40&5

Freezers, Ice Cream—

White Mountain ..... 60@60&5%
Granite State ..... 65@65&5%
Arctic ..... 70@70&5%
American 60%
Buffalo Champion ..... 65@65&5%
Shepard's Lightning ..... 65@65&5%
Gem 65%
Blizzard 70%
Double Action Crown 60%
Crown 60%
Star 60%
Peerless ..... 60&10%
Giant 60%
Zero ..... 60&10&10%
Boss and Pet ..... 60&10&10&10%
Keystone, P., D. & Co., each, $1.50.... 20%
Standard ..... 60@60&5%
Standard Double Action ..... 60@60&5%
Expert ..... 65@65&5%
Model ..... 60@60&5%
Confectioners' Machine 50%

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Funnels—

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10¢; 2 to 5 gro., 20¢; 5 to 10 gro. 30%
Copper, 1 to 6 doz., 15¢; 6 to 12 doz., 20¢; over 12 doz. 25%

Furnaces, Soldering—

Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. 3 Gem, Copper reservoir.$8.50

Fuse—Dis. 12½@15%. ℔ 1000 ft.

Common Hemp Fuse, for dry ground. $2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gates, Molasses—

Stebbin's Pattern ..... 80@80&5%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Chase's Hard Metal ..... 50&10%
Bush's 20%
Lincoln's Pattern ..... 70@70&10%
Weed's ..... 20&10%
Boss, ℔ doz.:
No. 1, $7 ; No. 2, $8 ; No. 3, $9 ; No. 4, $10 ..... 60&10&10%

Gauges—

Marking, Mortise, &c .... 60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 20&10%
Hoague & Peck's Champion Gauge—
With Scale ..... ℔ doz , $5.00
Without Scale ..... ℔ doz., $4.00
Wire, Wheeler, Madden & Co 10%
Wire, Morse's 25%
Wire, Brown & Sharpe's ..... 10@20%
Wire, P., S. & W. Co ..... 10&10%

Gimlets—

Nail and Spike ..... 50&10&5%
Eureka Gimlets ..... 40&10%
Diamond Gimlets ..... ℔ gr $5.00
Double Cut, Shepardson's ..... 45@45&5%
Double Cut, Ives' ..... 60@60&5%
Double Cut, Douglass' ..... 40&10%

Glue—

Le Page's Liquid ..... 25@25&5%
Upton's Liquid 35%
Improved Process ..... 25@25&5%
Dodd's Liquid Glue ..... 25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—

Fraser's ..... Keg ℔ lb 4¢, Pail ℔ lb 5¢
Fraser's, in boxes ..... ℔ gr $9.50
Dixon's Everlasting, in bxs.. ℔ doz 1 lb $1.20 ; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Lower grades, special brands. ℔ gr $5.50@$7.00
Axleine, tin boxes ..... ℔ gross $12.00
English Coach, wooden boxes ..... ℔ gross $8.50
English Coach, 5-lb tin pails. ℔ doz. $3.50
Tiger, wooden boxes ..... ℔ gross $7.00
Tiger, 5-lb tin pails ..... ℔ doz $2.85

Grindstones—

Small, less than car load lots at quarry ..... ℔ ton $9.00 @ $10.00
Family, regular list 60%
Family, Cleveland Stone Co. 20%

Grindstone Fixtures—

See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—

Sewing, Brass Fer. ℔ gr $8.50..... 45&10%
Pat. Sewing, Short. $1.00 ℔ doz.... 40&10%
Pat. Sewing, Long ..... ℔ doz $1.20
Pat. Peg, Plain Top. ℔ gr $10.00.. 45&10%
Pat. Peg, Leather Top. ℔ gr $12.00. 45&10%

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓%
Covert's Saddlery Works Horse and Cattle Ties... ..... 33⅓%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Hartford, Nail Hammers.....40&10%
Hartford, Machinists, &c.. 50&5@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....40&10@50%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

3 ℔ and under...℔ ℔40¢ } 75@75&10%, ac-
3 to 5 ℔.....℔ ℔36¢ } cording to
Over 5 ℔.....℔ ℔30¢ } size.
Wilkinson's Smiths.....10½¢@11¢℔ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins' No. 1 Loop, ℔ pr., 28¢; No. 3, 18¢; No. 6, 15¢; No. 2 and No. 4, Reversible, 18¢.
Champion.....15%

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.10	1.35	1.50

60&10&10%
Roggin's Latches.....℔ doz 30¢@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd. ℔ gr 4.50
Hickory Firmer Chisel, large. ℔ gr 5.00
Apple Firmer Chisel, ass'd... ℔ gr 5.00
Apple Firmer Chisel, large... ℔ gr 6.00
Socket Firmer Chisel, ass'd.. ℔ gr 3.00
Socket Framing Chisel, ass'd. ℔ gr 5.00
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75
Auger, assorted.....℔ gr 5.00 } 50%
Auger, large.....℔ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England..60&10&10@70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track..55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling.....50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....40&10@50%
Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ℔ doz pr. 4 in., $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader.50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50&5%
Wood Track Iron Clad, ℔ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ℔ set $6.00.....35%
Eclipse.....20&10%
Felix, ℔ set $4.50.....20%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction..20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, per set $6.00.....20&10%
Rider & Wooster, No. 1, 02¾¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap.33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....45%
Pendulum, Payson's.....40%
Moody.....45%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's..... } 40 & 10 @ 50&5%
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13...75@75&10%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.40, 60%
N. E.....℔ doz $7.00, 55%
N. E. Reversible.....℔ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....℔ doz $5.00, 55&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent.....40%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Stearns.....50&10%
Samson, ℔ gross.....$14.00

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10&5@60%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap... } 6 to 12 in., ℔ ℔.. 4¢ / 14 to 20 in., ℔ ℔..3½¢ / 22 to 36 in., ℔ ℔.. 3¢
Screw Hook and Eye.... } ½ in., ℔ ℔ 7¾¢ / ⅝ in., ℔ ℔ 5¾¢ / ¾ in., ℔ ℔ 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges { 8, 10 & 12 in., ℔ ℔.....5¢ / "Providence" { over 12 in. ℔ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....30%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat } 70@70&
Am. Axe and Tool Co., S. & O. Pat } 5%
Chattanooga Tool Co., S. & O. Pat..60& 5&60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Balz Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's List.... } 60&10&10%
Bird Cage, Reading.... }
Clothes Line, Sargent's list } 60&10&60&10&10%
Clothes Line, Reading list. }
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50&50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard..60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80@80&10%
Atlas, Coat and Hat.....60@60&10%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass,No.2, $2.00; No.3, $2.25; No. 4, $2.50
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition.....75@75&10&5%
Standard.....60&10&10@70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee.....50&10@60%

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $9.00
Self-Heating, Tailors'.....℔ doz $18.00
Mrs. Pott's Irons.....60@60&10%
Enterprise Star Irons.....60@60&10%
XX Cold Handle Sad Iron....60@60&10%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3¼¢
Combined Fluter and Sad Iron, ℔ doz. $15.00.....15%
Fox Reversible Self-Fluter, ℔ doz..$24.00
Chinese Laundry (N.E.Butt Co.)..85¢, 15%
New England.....5¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886, 35&2%

Pinking—

Pinking Irons, ℔ doz., 65¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓%
Victor.....33⅓%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....℔ doz. $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's Aa A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in.. $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Auburn Mfg. Co. Western Pat.....$2.00
Auburn Mfg. Co. Crescent.....$3.50
Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby..... } ...75@75&10&5%
P. S. & W..... }
Mix..... }
New Haven..... }
Merrill.....60&10@60&10&5%
Douglass.....75&75@5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Auburn Hay, Com. and Spear Point..50%
Auburn Straw.....40%
Nolin's Hay.....℔ doz. $7.00@$8.00%

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....℔ doz. $3.00, 25%
Buffalo Double Adjustable.. ℔ doz. $3.00, 25%

Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nickel..$2.00@$2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885..40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10
Carriage, Jap.....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...40%

Ladles—

Melting, Sargents'.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...℔ doz $4.00, 40%
Melting, P., S. & W.....35&10&10%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard....℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.00
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Police Lanterns—

2¾-inch Bull's-eye Police regular..... ℔ doz $3.60
3-inch Bull's-eye Police regular..... ℔ doz $3.90
2¾-inch Bull's-eye Police flash light..... ℔ doz $4.00
3-inch Bull's-eye Police flash light..... ℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70¢
Sargent's.....68¾&10%
Hotchkiss.....30¢
Peck, Stow & W. Co.....60&10¢

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....50¢
Class 3 and 4, Bronze Metal.....25¢
Class 3 and 4, Brass.....35¢
Skylight Lifters.....35¢
Crown, Eagle and Shield.....50¢
Reiher's, list Feb. 20, 1891.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....35%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%

Wire Clothes..Nos.	18	19	20
100 ft.....	$3.50	$3.00	$2.50

Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50..20%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Par. } List March, '84, rev.
ker and Corbin... } Jan. 1, '85.33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....30%
Stoddard Lock Co.....30@33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin..33⅓%
Yale.....net prices
Romer's.....25%

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889..... } 65&10@70% Much lower net prices often made.
Mallory, Wheeler & Co., list July, '88..... }
Sargent & Co., List Aug.1, '88 }
Branford Lock Works..... }

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40&40&10%
Yale.....net prices
Deltz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....25%

Padlocks—

List June'10, 1891.....50&2%
Norwich Lock Mfg. Co., old list....70&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 500.....15%
A. E. Deltz.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₩ doz $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90&25%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....85&5%
No. 41 line.....45&10%
No. 61 line.....50&5%
No. 21 line.....75%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₩ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....60%&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated.....₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard's "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Fish (Llesche's pat.), No. 100, ₩ gr., $8; No. 105, ₩ gr., $10.....40%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list January, 1889..70%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....₩ doz, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	50%
Snell's, Rice's Pat...	5.50	6.75,40&10&10%	
Jennings'....	5.50	6.75,45@45&10%	
Other Machines....	2.35	2.75	
Phillips' Patent with Augur....	7.00	7.50	
Miller's Falls....	7.50		25%

Fluting—

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Rolls, $2.15.....35%
Eagle, 5½-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35¢
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85, per doz $15.30.....40%
Shepard Hand Fluter, No. 110, ₩ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₩ doz $8.00.....40%
Clark's Hand Fluter, ₩ doz $15.00....35%
Combined Fluter and Sad Iron, ₩ doz $15.00.....30%
Buffalo, ₩ doz $10.00.....10%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Differential Pulley Block.....40%
Energy's Mfg. Co.'s.....25%
Sure Grip Steel Tackle Blocks.....25%

Washing—

Anthony Wayne, ₩ doz, No. 1, $51; No. 2, $45; No. 3, $42.
Western Star, ₩ doz, No. 2, $45; No. 2 $48.
Weisell.....₩ doz $54.00
Fair and Square.....₩ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Mattocks—Regular list.

60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ₩ dozen, $4; ½-peck, $3.50.

Meat Cutters—

See *Cutters, Meat.*

Menders Harness—

Per doz.....$2.00

Mills—

Coffee—

Box and Side, List Jan. 1, 1888, 60@60&10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co. 20&10@30%
The Swift, Lane Bros.....30%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Philadelphia.....60&10%
Pennsylvania and Continental.....60%
New Model and Excelsior.....60@60&10%
Other Machines.....60&10&10@75%

Muzzles—

Safety.....₩ doz, $3.00, 25%

Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92..80&10&10%
Tack Mfrs.' list.....70@70&10%
Wire Nails, Standard Penny, Card, Apr. 11, '92 base.....$1.85@$1.90

Horse—

	Nos. 6	7	8	9	10	
American	8¾	8½	8¼	8⅛	8⅛	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&5&5&2%
Clinton, Fin..	19¢	17¢	16¢	15¢	14¢	.30&10%
Essex	28¢	26¢	25¢	24¢	23¢	40&10&5&2%
Lyra	19¢	17¢	16¢	15¢	14¢	.40&5%
Snowden	19¢	17¢	16¢	15¢	14¢	.40&5%
Vulcan	23¢	21¢	20¢	19¢	18¢	.25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	.25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	.25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	.28¢	26¢	25¢	24¢	23¢	40&5&5&2%
Saranac	.23¢	21¢	20¢	19¢	18¢	...40&5%
Champion	.25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell	.19¢	18¢	17¢	16¢	16¢	.....10%
Anchor	.23¢	21¢	20¢	19¢	18¢	.....35%
Western	.23¢	21¢	20¢	19¢	18¢	.....50%
Empire Bronzed						.14 ₩ ℔

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Nies' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	.5.35¢	5.95¢ off list
Cold Punched	.5.00¢	5.10¢ off list

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—

Best or Government. .....₩ ℔ 6¾@7¼¢
U. S. Navy.....₩ ℔ 5¾@6¢
Navy.....₩ ℔ 5¢@5¼¢

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.00; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem, P., D. & Co.....₩ gro. $2
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....₩ doz 25¢, 15&20%
Lyman's.....₩ doz $3.75, 20%
No. 4, French.....₩ doz $2.25, 55&40%
No. 5, Iron Handle.....₩ gr $6.00, 45&50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 50&10&10%
Excelsior, No. 1 $2.50; No. 2, $1.50....40%
World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....55&5%
Domestic, ₩ doz $2.00.....45%
Champion, ₩ doz $2.00.....50%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₩ ℔ 80¢....20@25&5%

Miscellaneous—

American Packing.....10¢@11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13¢@14¢ ₩ ℔
Cotton Packing.....15¢@17¢ ₩ ℔
Jute.....7¢@8¢ ₩ ℔

Pails—

Galvanized—

	Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75	
Heiwig's	2.50	2.75	3.00	
Sidney Shepard & Co.	2.35	2.85	3.05	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₩ doz $5.40
Stable and Milk, 14 bt.....₩ doz $6.00
Fire Pails, deep.....₩ doz $5.40
Fire Pails, round bottom.....₩ doz $7.80

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ₩ doz.	$4.00	$4.50
Dairy Pails, 14 qt., ₩ doz.	4.50	5.00
Fire Pails, No. 1, 12 qt., ₩ doz	4.50	
Fire Pails, No. 2, 14 qt., ₩ doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14 qt.	6.50	7.50

Pans—

Dripping—

Small sizes.....₩ ℔ 6¼¢
Large sizes.....₩ ℔ 5¾¢
Silver & Co. (Covered).....40%

Fry—

Standard List: No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans.....60%

Dust—

Steel Edge, No. 1.....₩ doz $1.75

Paper and Cloth—

Sand and Emery—

List April 19, 1886.....50&10@50&10&5%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State....₩ doz 27.00@30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 13.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
72.....₩ doz 4.25
78.....₩ doz 7.00

Potato—

White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&5%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co....50&10@50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List July 21, 1892.

1¼ and under, Plain....57½&5@57½&10%
1¼ and under, Galv....47½&5@47½&10%
1½ and over, Plain.....67½&5@67½&10%
1½ and over, Galv.....57½&5@57½&10%
Boiler Tubes,
Sizes up to 2¾ in., inclusive...55@57½%
Sizes 3 in. and larger.....57½@62½%
Casing.....52½%
Inserted Joints Casing.....47½%
Steel Boiler Tubes.....27½%

Planes and Plane Irons—

Wood Planes—

Molding.....40&10@40&10&10%
Bench, First quality..50&10@50&10&10%
Bench, Second quality..55&10@55&10&10%
Bailey's (Stanley R. & L. Co.).....50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....35@35&10%
Meriden Mal. Iron Co.'s.....40@40&10%
Davis' Iron Planes.....40@40&10%
Birmingham Plane Co.....50@50&10%
Gage Tool Co.'s Self-Setting....20&10&10%
Chaplin's Iron Planes.....40@40&10%
Sargent's.....60%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to 2
Buck Bros.....30%
Auburn Thistle.....
Ohio.....} ....30&10%
Sandusky.....
L. & I. J. White.....25
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₩ ℔ 6¢@6¼¢

Pliers and Nippers—

Button's Patent.....50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₩ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in., $21.00.....50@50&5%
Cronk's Button Pattern.....50&10&10%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz. No. 1, $6.00; No. 2, $9.00.....25%
Silver & Co., 6-Ring, ₩ doz, $4.00; 3-Ring.....$2.00

Pokes, Animal—

Bishop's I. X. L.....₩ doz $6.00
Bishop's O. K.....₩ doz $5.25
Bishop's Pioneer.....₩ doz $3.75
Bishop's American.....₩ doz $2.75
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75
Bolding.....₩ doz $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's.....25%
Daley's Improved Handcuffs; 2 Hands, Polished, ₩ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ₩ doz, $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₩ gro, $6.00, 10%
Gem.....₩ gro, $4.50, 10%
Gold Medal.....₩ gro, $6.00, 25%
Lustro.....₩ gro, $4.75
Ruby.....₩ gro, $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢
Boynton's Noon Day.....₩ gro $13.00
Parlor Pride Stove Enamel, ₩ gro
Yates' Liquid, 2 gal ₩ gal...$0.80, 3 gal .70, 5 gal .60, 10 gal .50
Yates Standard Paste Polish, 10 ℔ cans, ₩ ℔ 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $10.00
Bonnell's Liquid Stove Polish, ₩ gro $9.00
Bonnell's Paste Stove Polish, ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ₩ ℔ 12¢
Black Flag.....₩ gro $7.20
Black Flag, 5 and 10 ℔ pails.....₩ ℔ 12¢
Black Flag, liquid, in bottles, ₩ gro $8.00
Diamond Rock Nickel Cleaner.....₩ gro $10.20
Raven Paste:
5-lb. pails, (per case of 6 or 12), ₩ ℔ .12¢
Less than case.....₩ ℔ .15¢
Liquid, 6 oz. bottles.....₩ gross, $8.00
Liquid, 8 oz. bottles.....₩ gross, $9.00
Water Polish.....₩ gross, $5.85

Poppers, Corn—

Round or Square, 1 qt..₩ gr $10.00@10.50
Round or Square, 1½ qt..₩ gr $15@$15.50
Round or Square, 2 qt..₩ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Powder—

In Canisters—

Fine Sporting, 1 ℔ each	$0.90
Duck, 1 ℔ each	.60
Rifle, 1 ℔ each	.30
Rifle, ½ ℔ each	.18
Rifle, ¼ ℔ each	.13

In Kegs—

Rifle, 25-℔ kegs	$5.00
Rifle, 12½-℔ kegs	2.75
Rifle, 6¼-℔ kegs	1.50
Duck, 12½-℔ kegs	5.75
Duck, 6¼ ℔ kegs	3.00
Trap, 25-℔ kegs	6.00
Trap, 12½-℔ kegs	3.25
Trap 6¼-℔ kegs	1.75

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ..... 20&10@30%
Henis ..... ℔ doz $3.50
Shepard's Queen City 40%
Silver & Co. ..... ℔ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Scranton ..... ℔ doz., $18.00, 33⅓&5%
Curtis Hammer ..... ℔ doz., $9.00
Giant, No. 1 ..... ℔ doz., $18.00, 10%
Giant, No. 2 ..... ℔ doz., $15.00, 10%
Pelican ..... ℔ doz., $9.00, 25%
Eclipse ..... Each, $2.00, net
Economy ..... ℔ doz., $6.00

Pulleys—

Hot House, Awning, &c. ..... 60&10%
Japanned Screw ..... 60&10%
Brass Screw ..... 60&10%
Japanned Side ..... 60&&10%
Japanned Clothes Line ..... 60&10%
Empire Sash Pulley ..... 55@60%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70 ..... 50%
Hay Fork, "F" Common and Patent Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Shade Rack 45%
Tackle Blocks—See Blocks.
Moore's Anti-Friction 5 in. Wheel, ℔ doz., $12.00 ..... 40%

Pumps—

Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ..... 67½@70%
Pitcher Spout, Cheaper G'ds .. 75@75&10%

Punches—

Saddler's or Drive, good .. ℔ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive .. 50&5%
Bemis & Call Co.'s Springfield Socket ... 50&5%
Spring, good quality .. ℔ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring and Check .. 40%
Solid Tinners', P., S. & W. Co., ℔ doz. ▶ $1.44 ..... 55%
Tinners' Hollow Punches, P., S. & W. Co. ..... 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Sawset and Punch—See Sawsets.

Rail—

Sliding Door, Wr't Brass .... ℔ ℔., 35¢, 40¢
Sliding Door, Bronzed Wr't Iron .. ℔ ft., 7¢
Sliding Door, Iron, Painted .. ℔ ft., 4¢, 40%
Barn Door, Light .. In. ⅛ ¼ ¾
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet ..... $3.15 2.70 3.25 Net
Terry's Steel Rail ..... ℔ ft., 4½¢
Victor Track Rail, 7¢ ℔ foot ..... 50&2%
Carrier, double braced, Steel Rail, ℔ foot ..... 4@4½¢
Moore's Wrought Iron 25%
Moody Steel Rail 45%

Rakes—

Cast Steel, Association goods .... 66⅔@70%
Cast Steel, outside g'ds .. 60&10&10@70&5%
Malleable ..... 70@70&5%
Gibbs Lawn Rake ..... ℔ doz., $4.90
Canton Lawn Rake ..... ℔ doz., $3.75
Favorite Lawn Rake ..... ℔ doz., $4.40
Oneida Lawn Rake ..... ℔ doz., $6.00
Fort Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00 ..... 25%

Razors—

J. R. Torrey Razor Co 20%
Wostenholm and Butcher, $10 to £ 10%
Jordan's AAAL new list ..... Net
Jordan's Old Faithful, new list ..... Net
Galvanic ..... ℔ doz., $15.00
Electric Cutlery Co. ..... Net
Campbell Cutlery Co. 50%

Razor Strops—See *Strops, Razor.*

Rings and Ringers—

Bull Rings—

Union Nut Co. 55%
Sargent's ..... 75&10%
Hotchkiss' low list 30%
Humason, Beckley & Co.'s ..... 70&10%
Peck, Stow & W. Co.'s .. 50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list .. 50@50&10%

Hog—

Top of the Hill Ringers ..... ℔ doz $2.00
Top of the Hill Rings ..... ℔ doz $1.25
Hill's Improved Ringers ..... ℔ doz $1.25
Hill's Old Style Ringers .... ℔ doz $1.12½
Hill's Tongs ..... ℔ doz $3.00
Hill's Rings ..... ℔ doz bxs $1.00
Perfect Rings ..... ℔ doz bxs $1.50
Perfect Ringers ..... ℔ doz $2.15@$2.25
Blair's Hog Ringers ..... ℔ doz $2.00
Blair's Hog Rings ..... ℔ doz 90¢@$1.00
Champion Ringers ..... ℔ doz $2.00
Champion Rings, Double ..... ℔ doz $2.25
Brown's Ringers ..... ℔ doz $2.00
Brown's Rings ..... ℔ doz $1.15@$1.25
Electric Hog Rings ..... ℔ doz boxes $1.50
Electric Hog Ringers ..... ℔ doz $2.00
Major Rings ..... ℔ doz $1.25
Major Ringers ..... ℔ doz $2.00

Rivets and Burrs—

Iron, list Nov. 17, '87 ..... 40%
Copper ..... 60&10%
Coppered Iron, Bettina Brand 40%

Rivet Sets—See *Sets.*

Rods—

Stair, Brass ..... 25@30¢
Stair, Black Walnut ..... ℔ doz 40¢

Rollers—

Barn Door, Sargent's list ..... 60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%
Thompson Mfg. Co.,s Lawn Rollers .. 30%

Rope—

Manila, 7-16 in. diam. and larger ℔ ℔ 12¼¢
Manila ..... ⅜ in. ℔ ℔ 12¾¢
Manila ..... ¼ and 5-16 in. ℔ ℔ 13¼¢
Manila, Tarred Rope ..... ℔ ℔ 11¾¢
Manila, Hay Rope ..... ℔ ℔ 12¼¢
Sisal ..... 7-16 inch and larger ℔ ℔ 10¼¢
Sisal ..... ⅜ in. ℔ ℔ 10¾¢
Sisal ..... ¼ and 5-16 in. ℔ ℔ 11¼¢
Sisal, Hay Rope ..... ℔ ℔ 10¼¢
Sisal, Tarred Rope ..... ℔ ℔ 9¾¢
Sisal, Medium Lath Yarn ..... ℔ ℔ 9¾¢
New Zealand .. 7-16 in. & larger ℔ ℔ 8¾¢
New Zealand ..... ⅜ inch, ℔ ℔ 9¼¢
New Zealand .. ¼ and 5-16 inch, ℔ ℔ 9¾¢
New Zealand, Hay Rope ..... ℔ ℔ 8¾¢
New Zealand, Tarred Rope .... ℔ ℔ 8¼¢
Note.—Manufacturers' prices on above 1¢ ℔ ℔ less, f.o.b. factory—less 1½ % for cash.
Cotton Rope ..... ℔ ℔ 13½@16¢
Jute Rope ..... ℔ ℔ 6½@7¢

Wire—

List February, 1892.
All kinds 45%

Rules—

Boxwood ..... 80&10&10%
Ivory ..... 50&50&10%
Starrett's Rules and Straight Edges, Steel ..... 25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—The following prices are generally cut by jobbers.

Disston's Circular ..... 45@45&5%
Disston's Cross Cut ..... 45@45&5%
Disston's Hand 25%
Woodrough & McFarlin.
Hand, Panel and Rip ..... 30@30&5%
Narrow Champion Cross Cuts with Handles, ℔ foot ..... 18@20¢
Champion Thin Back Cross Cuts, ℔ foot ..... 26@28¢
Champion Extra Thin Back Cross Cuts, ℔ foot ..... 29@31¢
One Man Champion Cross Cuts, ℔ foot ..... 37@40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip ..... 35@35&5%
Narrow Champion Cross Cuts with Handles, ℔ foot ..... 18@20¢
Champion Thin Back Cross Cuts, ℔ foot ..... 26@28¢
Champion Extra Thin Back Cross Cuts, ℔ foot ..... 29@31¢
One Man Champion Cross Cuts, ℔ ft.. 37@39¢
Atkins' Circular Shingle & Heading .. 50%
Atkins' Silver Steel Diamond X Cuts ℔ foot 70¢
Atkins' Special Steel Dexter X Cuts ℔ foot 50¢
Atkins' Special Steel Diamond X Cuts ℔ foot 32¢
Atkins' Champion and Electric Tooth X cuts ..... ℔ foot 30¢
Atkins' Hollow Back X Cuts .. ℔ foot 20¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles, ℔ foot 40¢
Peace Circular and Mill ..... 45@45&5%
Peace Hand Panel and Rip ..... 25@25&5%
Peace Cross Cuts ..... 45@45&5%
Richardson's Circular and Mill .. 45@45&5%
Richardson's X Cuts ..... 45@45&5%
Richardson's Hand, &c ..... 25@25&5%
C. E. Jennings & Co. Hand, Panel and Rip ..... 25@25&10%

Hack Saws—

Griffin's, complete ..... 40&10@50
Griffin's Hack Saw Blades .... 40&10@50
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—

Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cab Makers' $15,25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—

Hatch, Counter, No. 171, good quality, ℔ doz $21.00
Hatch, Tea, No. 161 .... ℔ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10
Riehle Bros.' Platform 40%

Scale Beams—See *Beams, Scale.*

Scissors, Fluting 45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $0.50 ..... 30&10%
Box, 1 Handle ..... ℔ doz $4.00 .. 10%
Box, 2 Handle ..... ℔ doz $6.00 .. 10%
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10&60%
Ship, Common ..... ℔ doz $3.50 net
Ship, R. I. Tool Co. 10%

Screen Window and Door Frames—See *Frames.*

Screw Drivers—See *Drivers, Screw.*

Screws—

Bench and Hand—

Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ℔ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&5%
Hand, Grand Rapids, list 35%
Lag, Blunt Point, list Jan. 1, 1890. 75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 75@75&10%
Bed ..... 25&5%
Hand Rail, Sargent's ..... 70&10%
Hand Rail, H. & F. Mfg. Co. .... 70&10@75%
Hand Rail, Am. Screw Co. 75%
Jack Screws, Millers Falls list .. 50@50&10%
Jack Screws, P., S. & W 35%
Jack Screws, Sargent 70%
Jack Screws, Stearns' ..... 40@40&10%

Cork—

Humason & Beckley Mfg. Co. .. 40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Howe Bros. & Hulbert 35%

Machine—

Flat Head Iron 65%
Round Head Iron 60%

Wood—

List January 1, 1891.

Flat Head Iron	70%	Extra 10 or 10 & 5% often given.
Round Head Iron	65%	
Flat Head Brass	70%	
Round Head Brass	65%	
Flat Head Bronze	70%	
Round Head, Bronze	65%	

Rogers' Drive Screws 82½%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grain ..... 40&5@40&10%
Grass ..... 40&10&50%

Scythe Snaths—See *Snaths, Scythe.*

Sets—

Awl and Tool—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00 ..... 55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $0 ..... 45%
Millers Falls Adj. Tool Hdls. Nos. 1, $12; 2, $18 ..... 25%
Henry's Combination Haft ... ℔ doz $0.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50 .. 70&10&5%

Nail—

Square ..... ℔ gr. $4.00@$4.25
Round ..... ℔ gr. $2.25
Buck Bros. 27½%
Cannon's Diamond Point ... ℔ gr. $12, 20%

Rivet—

Regular list 60%

Saw—

Stillman's Genuine .... ℔ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ℔ doz $3.25; Cross Cut, $5.25 ..... 55%
Common Lever ..... ℔ doz $2.00, 45@50%
Morrill's No. 1, $12.00 ..... 40&20%
No. 11, $15.00 ..... 40&10@40&20%
Nos. 3 and 4, $18.00 ..... 40&5%
No. 5, $24.00 ..... 40&5%
Leach's .. No. 0, $8.00; No. 1, $15 .. 15@20%
Nash's ..... 20&10@20&10&10
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat., 30&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine ..... $13.00, 50&10@60%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star 25%
Leopold ..... 40&10@50%
Atkin's Lever ..... ℔ doz No. 1, $6.00
Atkin's Criterion ..... ℔ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Chieftain Co.'s Superior ..... ℔ doz $7.00
Chieftain Co.'s Royal ..... ℔ doz $7.50
Crescent ..... ℔ doz $3.00
Lloyd's Acme ..... ℔ doz $15, 40&10%
Taintor Positive ..... ℔ doz $18, 50%

Sharpeners, Knife—

Larkins'.
Applewood Handles ... ℔ doz. $6.00, 40%
Rosewood or Cocobola. ℔ doz. $9.00 40%

Shaves, Spoke—

Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) .... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%
Goodell's ℔ doz. $9.00 ..... 25%

Shears—

American (Cast) Iron .. 75&10@75&10&5%
Barnard's Lamp Trimmers .. ℔ doz. $3.75
Tinners' ..... 20&2%
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears ..... 33⅓&
Cast Steel Trimmers: First quality ..... 80@80&10%
Second quality ..... 80&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears ..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Chicago Drop Forge & F. Co, Solid Steel Forged 60%
Davenport Cutlery Co. ..... 60@60&10%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list .. 60%
Galvanic 3⅛ to 9 in., ℔ doz. $1.00 ℔ inch
Electric Cutlery Co ..... Net
Campbell Cutlery Co., Jap'd 75%
Nickel Plated 65%

Pruning Shearsand Hooks.

Disston's Combined Pruning Hook and Saw ..... ℔ doz. $18.00, 20&10%
Disston's Pruning Hook, ℔ doz. $12.00 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat., ℔ doz. $5.75@$4.00
Henry's Pruning Shears, ℔ doz. $4.25 @$4.50
Wheeler, M. & C. Co., Combination, ℔ doz $12.00, 20%
Dunlap's Saw and Chisel, ℔ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co. 60%

Tinners', &c.—

Shears and Snips (P. S. & W.) ..... 20@25%
Snips, J. Mallinson & Co. ..... 33⅓&

Sheaves—

Sliding Door—

M. W. Co., list July, 1888 .... 50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&2%
Patent Roller ..... 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—

R. & E., list Dec. 18, 1885 ..... 60&10&2%
Sargent's list 70%
Reading list ..... 60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list) ..... 20&10&2%
Prize ..... 40&2%
Star, Club, Rival and Climax Brands ... 33⅓&10&2%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&2%
Trap brand, 12 and 10 gauge .. 33⅓&10&2%
Selbold's Comb. Shot Shells ..... 15&2%
Brass Shot Shells, 1st quality ..... 60&2%
Brass Shot Shells, Club, Rival, Climax. 65&2%

Shells Loaded—

Standard List, July 19, 1890 ..... 40&10&10@40&10&10&5%

Ship Tools—

L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, Diamond State & Bryden's Boss, at factory .. $4.00
Bryden's Frog Pressure, at factory .. $5.00

Mule—

Add $1 ℔ keg to above prices.

Ox Wrought—

Ton lots ..... ℔ ℔ 9¢
1000 ℔ lots ..... ℔ ℔ 9½¢
500 ℔ lots ..... ℔ ℔ 10¢

Shot—

	Ton lots	Small lots
Drop, up to B, 25-℔ bag	$1.40	$1.45
Drop, up to B, 5-℔ bag	.35	.35
Drop, B and larger, 25-℔ bag	1.65	1.70
Drop, B and larger, 5-℔ bag	.40	.40
Buck and Chilled, 25-℔ bag	1.65	1.70
Buck and Chilled, 5-℔ bag	.40	.40
Dust Shot, 25-℔ bag	2.00	2.00
Dust Shot, 5-℔ bag	.45	.45

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5&7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&10%
Griffith's Solid C. S. R. R. Goods 20%
St. Louis Shovel Co. ..... 20@20&7½%
Hussey, Binns & Co. ..... 15@25%
Hubbard & Co. ..... 20@20&7½%
Lehigh Mfg. Co. ..... 50&10%
H. M. Myers Co. 30%
Payne Pettebone & Son ..... 33⅓&5%
Remington's (Lowman's Pat.) .. 30&10@40%
Rowland's Black Iron ..... 50&10%
Rowland's Steel ..... 60&5@60&10%
Terra Haute Shovel & Tool Co. 25%

Shovels and Tongs—

Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves—

Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & Co. ..... 50&25%
Shaker (Barler's Pat.) Flour Sifters ℔ doz $2.00; ℔ gr $21.60
Electric ..... ℔ gr $21.00
A. & W. Sifters ..... ℔ doz $2.00
Hunter's ..... ℔ doz $2.00

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ℔ doz	$0.80	$1.00
Mesh 20, Nested, ℔ doz	.95	1.10
Mesh 24, Nested, ℔ doz	1.15	1.25

Skeins, Thimble—

Western list ..... 75&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co. 60%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

Slates—

School, by case ..... 50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded....70&10&10%
German, new list.....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&2%
Covered Spring.....60&10&10%
Covert's Saddlery Works' Triumph..33⅓%

Snaths, Scythe—

List.....50@50&5%

Soldering Irons—

See *Irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₱ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list.....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo, S. S. & Co.....33⅓&2%

Silver Plated—

4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bros.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co.....40, 15&5%
L. Boardman & Son.....50&12½%

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%

Wm. Rogers Mfg. Co.:
Rogers' Silver Metal.....50&10&5%
18% Rogers' German Silver.....60&5%
22% Rogers' Nickel Silver.....50&5%
German Silver.....50&50&5%
German Silver, Hall & Elton...50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Brittannia.....60@5%
Boardman's Nickel Silver, list July 1, 1891.....60&7½&5%
Boardman's Brittannia Spoons, case lots.....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in.....₱ doz $1.20@1.25
Gray's, ₱ gr. $20.00.....25%
Bee Rod, ₱ gr., $20.00.....20@25%
Warner's No. 1, ₱ doz $2.50; No. 2, $3.30.....50@50&5%
Gem (Coil), list April 19, 1886....10@15%
Star (Coil), list April 19, 1886...20@20&5%
Victor (Coil).....60&10@60&10&5%
Champion (Coil).....60&10@60&10&10%
Cowell's, No. 1, ₱ doz $18.00; No. 2, $15.00.....50@50&10%
Rubber, complete, ₱ doz $4.50.....55&10%
Hercules.....50@50&10%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll.....60&10&10%
Cliff's Bolster Springs.....25%

Squares—

Steel and Iron.....
Nickel-Plated.....85@85&5%

Try Square and T Bevels.....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares.....25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Squeezers—

Fodder—

Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Lemon—

Porcelain Lined, No. 1....₱ doz $6.00.....25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved.....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₱ doz $12.00
Silver & Co., Glass.....₱ gro. $9.00
Manny Lemon Juice Extractor:
Standard.....₱ doz $0.75@$1.00
Improved.....₱ doz $2.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Blind—

Barbed, ½ in. and larger....₱ ℔ 7@7½¢
Barbed, ¾ in.....₱ ℔ 8@8½¢
Fence Staples, Galvanized. } Same price
Fence Staples, Plain..... } as B'rb Wire
See Trd. Rep

Steelyards 40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods.....35%
Butterfield's Goods.....35%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates.....25@30%
Reversible Ratchet.....30%
Gardner.....25%
Green River.....25@30%

Stops, Bench—

Morrill's.....₱ doz $9, 50%
Hotchkiss's.....₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9, 25&10&5%
McGill's, ₱ doz $3.....10%
Cincinnati.....25&10%
Terrell's Nos. 1 and 2, ₱ doz., $3; No. 3, $3.00.....30%

Stone—

Sythe Stones—

Pike Mfg. Co., list April, 1892.....33⅓%

Oil Stones, &c.—

Pike Mfg. Co:	Price ₱ ℔	
Hindostan No. 1....	.8¢	
Sand Stone	.5¢	33⅓ @ 33⅓ &10%
Turkey Oil Stone, 4 to 8 in	.80¢	
Turkey Slips	$2.00	
Washita Stone, Extra	.50¢	Dis. 40@40&10%
Washita Stone, No. 1	.40¢	
Washita Stone, No. 2	.30¢	
Washita Slips, Extra	.80¢	
Washita Slips, No. 1	.70¢	
Arkansas Stone, No. 1, 3 to 5½ in., $2.80		
Arkansas Stone, No. 1 5½ to 8 in., $3.50		
Lake Superior	₱ ℔ 13¢	
Lake Superior Slips	₱ ℔ 20¢	

Stove Polish—

See *Polish, Stove.*

Stretchers, Carpet—

Cast Steel, Polished.....₱ doz $2.2
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Strops, Razor—

Genuine Emerson.....60@60&5%
Imitation " .....₱ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co.....Net
Campbell Cutlery Co.....Net

Stuffer or Fillers, Sausage—

Miles' Challenge, ₱ doz $20....50@50&5%
Perry....₱ doz, No. 1, $15.00; No. 0, $21.00.....50&5%50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5.....₱ doz $17.00
Bissell No. 8.....₱ doz $20.00
Bissell, Grand.....₱ doz $36.00
Standard.....₱ doz $24.00
Domestic.....₱ doz $21.00
Domestic, No. 2.....₱ doz $22.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Improved Parlor Queen,
Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
Parlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Ladies' Friend.....₱ doz $15.00
Advance.....₱ doz $18.00
Supreme.....₱ doz $22.00

Lawn—

Thompson Mfg. Co.....30%

Tacks, Brads, &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued.....66⅔%
American, Tin'd and Cop'd.....70%
Steel, Bright and Blued.....66⅔%
Steel, Tinned and Coppered.....70%
Swedes Iron, Blued.....72½%
Swedes Iron, Tinned.....75%
American Iron Tacks, Domestic.66⅔%
Swedes Iron Tacks—
S. S., Blued.....66⅔%
S. S., Tinned.....70%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Gimp and Lace Tacks—
S. S., Blued.....62½%
S. S., Tinned.....66⅔%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Basket and Trimmers' Tacks—
Lanc.....52½%
S. S.....60%
Hungarian Nails.....60%
Common and Patent Brads.....55%
Leathered Tacks.....10%
Brush Tacks, S. S.....60%
Looking Glass Tacks, S. S.....35%
Picture-Frame Points, S. S.....35%
Finishing Nails.....60%
Trunk and Clout Nails—
Black.....62½%
Tinned or Coppered.....66⅔%
Basket Nails.....60%
Chair Nails.....52½%
Cigar Box Nails.....45%
Tin Capped Nails.....50%
Extra discount 25&2%

Miscellaneous—

Double Point.....90@90&10%
Wire Carpet Nails.....50&10%
Plymouth Rock Steel Carpet Tacks...25%

Wire Brads and Nails—

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%

See also *Nails, Wire.*

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list.....50&10&5%

Tinners' Shears, &c —

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887.....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tools—

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves Cincinnati Tool Co.....20%

Lumber—

Ring Peavies, "Blue Line"..₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall Iron Socket Peavies.....₱ doz $19.00
Cant Hooks, "blue Line"....₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks.....₱ doz $18.00

Saw—

Atkins' Perfection.....₱ doz $12.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Tobacco Cutters—

See *Cutters, Tobacco.*

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₱ doz holes, 9@10¢
Mouse, Round Wire.....₱ doz $1.50 10%
Mouse, Cage, Wire.....₱ doz $2.50 10%
Mouse, Catch-'em-alive..₱ doz $2.50 15%
Mouse, Bonanza.....₱ doz 0.90@$1.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz., 75¢; in full cases, ₱ doz.60@65¢
Hotchkiss Imp. Rat Killer...₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50
Schuyler's Rat Killer.....₱ gro $15.00

Triers—

Butter and Cheese.....25%

Trimmers, Spoke—

Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. .....55&10%
Douglas'.....₱ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering.....20@10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering..25@25&5%
Peace's Plastering.....25@25&5%
Clement & Maynard's.....20@20&5%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%
Cleves' Angle Trowel, ₱ gro, No. 1, $30; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Thompson Mfg. Co.....25%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—

	BC.	B.
No. 9, ¼ and ½ ℔ Balls	25¢	31¢
No. 12, ¼ and ½ ℔ Balls	22¢	30¢
No. 18, ¼ and ½ ℔ Balls	20¢	29¢
No. 24, ¼ and ½ ℔ Balls	20¢	29¢
No. 36, ¼ and ½ ℔ Balls	18¢	28¢

No. 264 Mattrass, ¼ and ½ ℔ Balls,52@54¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....15½¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls.....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔..15¢@16¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls.....10¢
Wool.....6¼¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ₱ to doz..18¢

Vises—

Solid Box.....50&10@50&10&5%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers' Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....70&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20@25%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%

Miscellaneous—

Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up.. 68¢
U.M.C.&W.R.A.—B. E., 9&10.. 82¢
U.M.C.&W.R.A.—B. E., 8..... 96¢
U.M.C.&W.R.A.—B. E., 7.....$1.10
U.M.C.&W.R.A.—P. E., 11 up. 1.15
U.M.C.&W.R.A.—P. E., 9&10.. 1.50
U.M.C.&W.R.A.—P. E., 8..... 1.70
U.M.C.&W.R.A.—P. E., 7..... 1.80
Dis. 50@2%
Eley's B. E., 11 and larger.....$1.70@1.75
Eley's P. E., 12 to 20..... 3.00@ 3.25

Wagon Boxes—

See *Boxes, Wagon.*

Washer Cutters—

See *Cutters, Washers.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled Ware—
Maslin Kettles.....75@75&5%
Boilers and Saucepans.....60@60&5%
Tinned Boilers and S'pans.....60@60&5%
Rustless Hollow Ware.....50@50&5%
Gray Enameled Ware—
Stove.....50%
Maslin Kettles.....60@60&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware....dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dozen Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¾ in.	...	4.00
Cuspidors	...	8.00
Spittoons, "Daisy," 8 in.	4.00	4.50
Peck Measure	4.00	
Half-peck Measure	3.50	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₱ doz.....$8.40
Basins, Ringed, ₱ doz., No. 2.....3.00
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$2.90
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$1.70
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ₱ set.....$1.60
25%
See also Pails.

Silver Plated, Hollow—

4 mo. or 5 % cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....
40&5%
40&5&5%

Washers—

Size hole..... 5-16 ⅜ ½ ⅝ to 1⅜
Washers..... 6 5 3.50¢ 3
In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—

Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 3¾¢

Weights, Sash—

Solid Eyes.....₱ ton $18.00@$19.00

Well Buckets, Galvanized—See *Buckets, Well, Galvanized.*

Wheels, Well—

8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire and Wire Goods—

Iron—

Market,
Br.& Ann.,Nos.0 to 18.75&10@75&10&5%
Cop'd, Nos. 0 to 18..... .....75&5%
Galv., Nos. 0 to 18.....70@70&5%
Tin'd. Tin'd list, Nos. 0 to 18.70@70&10%

Stone,
Br. and Ann'd, Nos. 16 to 18.....80%
Bright and Ann'd, Nos. 19 to 26...80&5%
Br. and Ann'd, Nos. 27 to 36.....82½&5%
Tinned.....

Tinned Broom Wire, 18 to 21, ₱ ℔...4¾¢
Galvanized Fence, Nos. 8 and 9... 70&10%
Brass, list Jan. 18, 1884.....25@33⅓%
Copper, list Jan. 18, 1884.....33⅓@40%
Annealed Wire on Spools.....60%
Mallin's Steel and Tin'd on Spools.....60%
Mallin's Brass and Cop. on Spools.....50%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass.....50%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to £, 30%
Steel Music Wire, 12 to 30, imported....
60@70¢ ₱ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....80&20@85%

Wire Cloth and Netting—

Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.40
Galvanized Wire Netting.....75@75&10%

Wire, Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50&3%
Coes' "Mechanics".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural..... 75&10@80%
Lamson & Sessions' Agric'l..
Bemis & Call's:
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg s Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%

Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz., $.400, 40%
Webster's Pat. Combination.....25%
Boardman's.....30%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70@70&5%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&3%

Wringers, Clothes—

Am. Wringer Co.'s list July1,'92..2% cash
Colby WringerCo.,listSept.1, '91..2% cash
Lovell Mfg. Co., list Jan. 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1892 85&25%

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils

Linseed, City, raw.. per gal.	..	@	41
Linseed, City, boiled.....	..	@	44
Linseed, Western, raw.....	..	@	40
Lard, City, Extra Winter...	..	@	72½
Lard, City, Prime.....	70	@	..
Lard, City, Extra No. 1.....	..	@	55
Lard, City, No. 1.....	..	@	45
Lard, Western, prime.....	..	@	70
Cotton-seed, Crude, prime..	..	@	28
Cotton-seed, Crude, off grades.....	26	@	27
Cotton-seed, Summer Yellow, prime.....	30	@	31
Cotton-seed, Summer Yellow, off grades.....	29	@	30
Sperm, Crude.....	67	@	..
Sperm, Natural Spring.....	67	@	70
Sperm, Bleached Spring....	72	@	75
Sperm, Natural Winter.....	73	@	76
Sperm, Bleached Winter....	78	@	81
Whale, Crude.....	..	@	45
Whale, Natural Winter.....	55	@	56
Whale, Bleached Winter....	58	@	59
Whale, Extra Bleached.....	59	@	60
Sea Elephant, Bleached Winter.....	62	@	63
Menhaden, Crude, Sound...	30	@	31
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed...	37	@	..
Menhaden, Bleached W'ter.	38	@	..
Menhaden, Extra Bleached.	40	@	42
Tallow, City, prime.....	44	@	45
Tallow, Western, prime....	42½@@		43
Cocoanut, Ceylon.....	5¼@		..
Cocoanut, Cochin.....	6¾@		6¾
Cod, Domestic.....	38	@	40
Cod, Foreign.....	42	@	45
Red Elaine.....	34	@	36
Red Saponified.....₱ ℔	4½@@		5
Bank.....per gal	35	@	36
Straits.....	36	@	37
Olive, Italian, bbls.....	64	@	65
Neatsfoot, prime.....	50	@	55
Palm, prime, Lagos.....₱ ℔	5¾@		6¼

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test.....per gal	7	@	7½
Black, 29 gravity, 15 cold test.....	7½@		8
Black, 29 gravity, summer..	6	@	6½
Cylinder, light, filtered.....	14	@	16
Cylinder, dark, filtered.....	10	@	13
Paraffine, 23½@24 gravity..	11½@		12
Paraffine, 25 gravity.....	10½@		11
Paraffine, 28 gravity.....	8	@	8½
Paraffine, red.....	9	@	1⅛

Paints and Colors—

Barytes, Foreign, ℔ ton..$22.00			@24.00
Barytes, Amer. floated....29.00			@32.00
Barytes, Amer. No. 1.....15.00			@17.00
Barytes, Amer. No. 2.....13.00			@15.00
Barytes, Amer. No. 3.....11.00			@12.00
Blue, Celestial.....₱ ℔	6	@	8
Blue, Chinese.....	40	@	50
Blue, Prussian.....	25	@	40
Blue, Ultramarine.....	8	@	25
Brown, Spanish.....	⅛@@		1
Brown, Vandyke, Amer...	3	@	3½
Brown, Vandyke, English.	6	@	8
Carmine, No. 40, in bulk..	3.10	@	..
Carmine, No. 40, in boxes or barrels.....	3.20	@	..
Carmine, No. 40, in ounce bottles.....	4.20	@	..
Chalk, in bulk.....₱ ton..	1.65	@	1.90
Chalk, in bbls..₱ 100 ℔...	33	@	40
China Clay, English..... ₱ ton.	13.00	@	18.00
Cobalt Oxide, prep'd.....	9.00	@	11.00
Cobalt Oxide, black..... lots 100 ℔.	2.50	@	....
Cobalt Oxide, black..... less 100 ℔..	2.65	@	2.90
Green, Paris, in bulk....	13	@	15½
Green, Paris, 170 @ 175 ℔ kegs.....	14	@	16
Green, Paris, small pack.	15½@@		22
Green, Chrome, ordinary.	6	@	12
Green, Chrom.', pure.....	22	@	25
Lead, Eng., B.B. white....	8½@@		10
Lead, Amn. White, dry or in oil:			
Kegs, lots less than 500 ℔...	7¼	@	7½
Kegs, lots 500 ℔ to 5 tons...	6¾	@	7
Kegs, lots 5 tons to 12 tons..	6⅝	@	6¾
Kegs, lots 12 tons and over..	6¼	@	6¾
Lead, White, in oil, 25 ℔ tin pails, add to keg price.....	..	@	½
Lead, White, in oil. 12½ ℔ tin pails, add to keg price.....	..	@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.	..	@	½
Lead, Red, bbls. and ½ bbls..	6¼	@	7¼
Lead, Red, kegs.....	6¼	@	7½
Litharge, kegs.....	6½@@		7¼
Litharge, bbls. and ½ bbls.....	6¼@		7¼

TERMS, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle	1.35	@	1½
Ocher, French Washed.....	1½@@		2½
Ocher, German Washed....	1½@@		3
Ocher, American.....	½@@		1½
Orange Mineral, English....	8½@@		9
Orange Mineral, French.....	10	@@	10½
Orange Mineral, German....	8½@@		9
Orange Mineral, American..	8½@@		8¾
Paris White, English Cliff-stone.....	1.00	@	1.15
Paris White, American.....	70	@	75
Red, Indian, English.....	5½@@		7
Red, Indian, American.....	2	@@	6½
Red, Turkey.....	9	@@	14
Red, Tuscan.....	9	@@	11
Red, Venetian, American... ₱ 100 ℔..	1.00	@	1.10
Red, Venetian, English.....1.20		@	1.35
Sienna, Italian, Burnt and Powd, ₱ ℔.....	4	@	5
Sienna, Ital., Burnt Lumps.	1½@@		3½
Sienna, Ital., Raw, Powd...	4½@@		5½
Sienna, Ital., Raw, Lumps..	1¾@@		3½
Sienna, American, Raw.....	1½@@		1¾
Sienna, American, Burnt and Powdered.....₱ ℔	1½@@		1¾
Talc, French.....	1½@@		1½
Talc, American.....	0½@@		1¼
Terra Alba, Fr'ch, ₱ 100 ℔	75	@@	80
Terra Alba, English.....	70	@	75
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	45	@	50
Umber, Turkey, Burnt and Powdered.....₱ ℔	3½@@		4
Umber, Turkey Bnt. Ln.....	2¾@@		3
Umber, Turkey, Raw and Powdered.....	3½@@		..
Umber, Turkey, R'w Lumps	2½@@		2¾
Umber, Turkey, Bnt. Amer..	1½@@		1½
Umber, Turkey, R'w Amer.	1¼@@		1½
Yellow, Chrome.....	10	@@	25
Vermillion, American Lead.	11¼@@		12
Vermillion, Quicks'er, bulk..	57	@@	..
Vermillion, Quicks'er, bags..	58	@@	..
Vermillion, Quicksilver sm'r pkgs.....	62	@@	..
Vermillion, English Import.	85	@@	90
Vermillion, Imitation, Eng..	8	@@	35
Vermillion, Trieste.....	90	@@	92½
Vermillion, Chinese.....	92½@@		95
Whiting Common, ₱ 100 ℔	37½@@		42½
Whiting Gilders'.....	45	@@	55

Zinc, American, dry.....₱ ℔	4¼@@		5
Zinc, French, Red Seal.....	7½@@		..
Zinc, French, Green Seal	9	@@	..
Zinc, French, V. M. X.....	..	@@	7
Zinc, Antwerp, Red Seal....	7½@@		..
Zinc, Antwerp, Green Seal..	7¾@@		..
Zinc, German, L. Z. O.....	6¾@@		7¼
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10¾@@		11¼
lots less than one ton.....	11	@@	11½
Zinc, V. M. in Poppy Oil, Red Seal..	..	@@	..
lots of 1 ton and over.....	10	@@	10½
lots of less than 1 ton.....	10¼@@		10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1% ; 25 bbls., 2% ; 50 bbls. 4%. No discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfort.....	25	@	30
Black, Drop, English.....	12	@	15
Black, Drop, Domestic.....	7	@	10
Black, Lampblack, Best	20	@	35
Black, Lampblack, Common	7	@	18
Black, Ivory.....	8	@	15
Blue, Chinese.....	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramarine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18¾
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber, Raw.....	7	@	10
Umber, Burnt.....	7	@	10

Putty—

In barrels and ½ bbls.....	.01¾@@		.01¾
In tubs.....	.01¾@@		.01¾
In tin cans.....	.01½@@		.02½
In bladders..	.01⅞@@		.02¼

Spirits Turpentine—

In regu bbls.....	..	@	30
In machine bbls.....	..	@	30½

Glue—

Low Grade.....₱ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	15
Irish.....	12	@	..

"IDEAS FOR HARDWARE MERCHANTS."

There is probably no line of business which calls for such an infinite amount of patience in attention to details and so much ingenuity in general management as that of the successful hardware merchant.

Mr. D. T. MALLETT's book of ideas is not a cheap circular made up of threadbare advice and moth-eaten maxims—a publication that you will throw aside without a second glance. It is a handsomely printed, practical book, containing nearly two hundred pages of interesting reading matter and written by a successful business man who thoroughly understands his subject.

SEND FOR IT. PRICE, $1.00

Mallett's "Ideas for Hardware Merchants."

There is not a dull chapter in the whole book: not a page but is filled with practical suggestions and valuable information. If your business is poor it will help you to make it good. If good you can make it better,

EMBRACES CHAPTERS ON

How to Advertise a Hardware Store. How to Select Seasonable Goods and How to Display them. How to dress a Window, and How to Compete with Department Stores.

Mr. Mallett gives you useful points on systematizing business; on the *treatment and management* of clerks; on the best way to secure *low quotations* from jobbers and manufacturers, and on the arrangement of price-lists. There are a thousand practical ideas embraced in this book.

Sent, Postpaid, on Receipt of Price, by

DAVID WILLIAMS, Publisher and Bookseller, **96-102 Reade St., N.Y.**

CURRENT METAL PRICES.

OCTOBER 19, 1892.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron:
¾ to 2 in. round and square.. } ₩ lb 1.90 @ 2.00¢
1 to 6 in. x ⅜ to 1 in.... }
Refined Iron:
¾ to 2 in. round and square. }
1 to 4 in. x ⅝ to 1½ in.... } ₩ lb 2.00 @ 2.10¢
4½ to 6 in. x ⅜ to 1 in. }
1 to 6 in. x ¼ and 5-16.... ₩ lb 2.30 @ 2.30¢
Rods—⅜ and 11-16 round and sq. ₩ lb 2.10 @ 2.20¢
Bands—1 to 6 x 3-16 to No. 12.... ₩ lb 2.30 @ 2.40¢
"Burden Best" Iron, base price. ₩ lb.... 3.00¢
Burden's "H. B. & S." Iron, base price.... ₩ lb.... 2.80¢
"Ulster".... ₩ lb.... 3.00¢
Norway Bars.... 3.75 @ 4.00¢
Norway Shapes.... 4.50 @ 5.00¢

Merchant Steel from Store—

	Per lb
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots.	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store—

Black—

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb 3 @	3¾¢
17 to 20	₩ lb 3½ @	3¾¢
21 to 24	₩ lb 3¼ @	3¾¢
25 and 26	₩ lb 3⅜ @	3¾¢
27	₩ lb 3½ @	3¾¢
28	₩ lb 3⅝ @	4 ¢
American B. B.	₩ lb 4¢ @ 4½¢	

Galvanized Sheet Iron—

	B. B.
Nos. 10 to 16	₩ lb 4.20¢
17 to 22	₩ lb 4½¢
23 to 24	₩ lb 4¾¢
25 to 26	₩ lb 5 ¢
27	₩ lb 5¼¢
28	₩ lb 5½¢
29 to 30	₩ lb 6½¢
Genuine Russia, according to assortment	₩ lb 12¢ @ 13¢
Patent Planished	₩ lb A, 10¢; B, 9¢
Craig Polished Sheet Steel	₩ lb, 8½¢

English Steel from Store—

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" " Annealed	₩ lb 75 ¢
" " "Titanic"	₩ lb 20 ¢

METALS—

Tin—

	Per lb
Banca, Pigs	22 ¢
Straits, Pigs	21¼¢ @ 21¾¢
Straits in Bars	23 ¢

Tin Plates—

Duty: 2.2¢ ₩ lb.

Charcoal Plates—Bright—

Guaranteed Plates command special prices, according to quality.

			Per box.
Melyn and Calland Grade.	IC, 10	x14..	@ $6.50
" " "	IC, 12	x12..	@ 6.75
" " "	IC, 14	x20..	@ 6.50
" " "	IC, 20	x28..	@ 13.00
" " "	IX, 10	x14..	@ 8.50
" " "	IX, 12	x12..	@ 8.75
" " "	IX, 14	x20..	@ 8.50
" " "	IX, 20	x28..	@ 17.00
" " "	DC, 12¼	x17..	@ 6.00
" " "	DX 12¼	x17..	@ 8.00
Allaway Grade	IC, 10	x14..	@ 6.00
" "	IC, 12	x12..	@ 6.25
" "	IC, 14	x20..	@ 6.00
" "	IC, 20	x28..	@ 12.00
" "	IX, 10	x14..	@ 7.50
" "	IX, 12	x12..	@ 7.75
" "	IX, 14	x20..	@ 7.50
" "	IX, 20	x28..	@ 15.00
" "	DC, 12¼	x17..	@ 5.50
" "	DX, 12¼	x17..	@ 7.00

Coke Plates—Bright—

Steel Coke.—IC, 10 x 14, 14 x 20..	$5.50	@ $5.60
10 x 20..	....	@ 8.50
20 x 28..	11.50	@ 12.00
IX, 10 x 14, 14 x 20..	....	@ 7.00
BV Grade.—IC, 10 x 14, 14 x 20..	....	@ 5.50

Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality.

Dean Grade.—IC, 14 x 20	..	@ $5.75
20 x 28	11.00	@ 11.25
IX, 14 x 20	....	@ 6.50
20 x 28	....	@ 13.00
Abecarne Grade.—IC, 14 x 20	....	@ 5.65
20 x 28	....	@ 11.00
IX 14 x 20	....	@ 6 50
20 x 28	....	@ 13.00

Tin Boiler Plates—

IXX, 14 x 26	112 sheets	@ $13.35
IXX, 14 x 28	112 sheets	@ 14.50
IXX, 14 x 31	112 sheets	@ 16.00

Copper—

DUTY: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which copper is a component of chief value), 35 % ad valorem.

Ingot—

Lake	@ 12¼¢
Ansonia grade Arizona	@ 11¾¢
Ansonia grade Casting	@ 11 ¢

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 10 % @ 20 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per sq. foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	21	22	23	24	25	28	30
30		72	22	22	22	26	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	26	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Ov'r 84 in. wide			25	27	....	....	....	....	....	....

Bolt Copper, ⅜ inch diameter and over, per pound.... 22¢
Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3¢ ₩ lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 4¢ ₩ lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ ₩ lb advance over prices of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper over 20 in. wide, 2¢ ₩ lb advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

	Per lb.
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter, 2¢ ₩ lb additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.
10 %@ 20 % discount, according to size of order.

Copper Wash Bowl Bottoms—

Tinned ₩ lb 34¢, 10% @ 20%

Tinning—

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each 8¢
Tinning sheets on one side, 30 x 60 each 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each 12¢
Tinning sheets on one side, other sizes, per square foot 2½¢
For tinning both sides double the above prices.

Planished Brass and Copper—

Not larger than 30 x 60.

16 oz. and heavier	24¢ ₩ lb
14 oz.	25¢ ₩ lb
12 oz.	27¢ ₩ lb

Seamless Brass Tubes—

July 6, 1892. Net.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1⅛
8-14	6-12	32	28	25	24	23	22	19
15	13	33	28	26	25	24	23	20
16	14	34	29	27	26	25	24	20
17	15	35	30	28	25	26	25	21
18	16	37	31	29	27	26	25	22
19	17	38	32	30	29	28	27	24
20	18-19	39	34	32	31	30	29	26
21	20	41	36	34	33	32	31	29
22	21	43	37	36	34	33	32	31
23	22	45	39	37	36	35	34	34
24	23	48	41	39	38	36	35	36
25	24	51	44	41	40	39	38	40

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional
Brazed Brass Tubing. (To No. 20 inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	30 @ ..%

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge)

Common High Brass:	Wider than	and including	in. 2	in. 10	in. 12	in. 14	in. 16	in. 18	in. 20	in. 22	in. 24
To No. 20, inclusive			.21	.22	.23	.25	.27	.29	.31	.33	
Nos. 21, 22, 23 and 24			.22	.23	.24	.26	.28	.30	.32	.34	
Nos. 25 and 26			.22½	.23½	.24½	.27	.29	.31	.33	.35	
Nos. 27 and 28			.23	.24	.25	.28	.30	.32	.34	.36	

Common High Brass:	Wider than	and including	in. 24	in. 26	in. 28	in. 30	in. 32	in. 34	in. 36	in. 38	in. 40
To No. 20, inclusive			.36	.39	.42	.46	.50	.55	.60	.65	
Nos. 21, 22, 23 and 24			.37	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26			.38	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28			.39	.42	.45	.49	.53	.58	.65	.75	

Discount from List 10 % to 25 %.

Brass and Copper Wire—

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive	$0.22	$0.24	$0.26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 and No. 20	.24	.26	.28	.32
No. 21, or 0.032 diameter	.25	.27	.29	.33

Discount 10 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22	$0.26	$0.28	$0.30	$0.34
No. 23	.28	.30	.32	.36
No. 24	.30	.32	.34	.38
No. 25	.32	.34	.36	.40
No. 26	.35	.37	.39	.43
No. 27	.38	.40	.42	.46
No. 28	.42	.44	.46	.51
No. 29	.45	.47	.49	.54
No. 30	.48	.50	.52	.62
No. 31	.51	.53	.55	.67
No. 32	.55	.57	.59	.73
No. 33	.59	.61	.63	.82
No. 34	.64	.66	.68	.95
No. 35	.70	.72	.74	1.30
No. 36	.76	.78	.80	1.50
No. 37	1.00	1.02	1.04	1.70
No. 38	1.30	1.32	1.34	2.00
No. 39	2.00	2.02	2.00	3.25
No. 40	2.60	2.62	2.60	5.75

— % discount.
Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs—

	Per lb.		Per lb.
No. 5	49¢	No. 11	56¢
No. 6	49¢	No. 12	58¢
No. 7	49¢	No. 13	60¢
No. 8	50¢	No. 14	65¢
No. 9	52¢	No. 15	70¢
No. 10	54¢		

60 % @ 5 % discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

¼ to 3½ inches inclusive	17¢ ₩ lb
Over 3½ to 5 inches inclusive	18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

¼ to 3½ inches inclusive	18¢ ₩ lb
Over 3½ to 5 inches inclusive	19¢ ₩ lb

Spelter—

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	5¼¢
Bertha (pure)	8½¢

Zinc—

Duty: Sheet, 2½¢ ₩ lb.

600 lb casks	7 ¢
Per lb	7½¢

Lead—

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American Pig	4½¢
Bar	5¢
Pipe, subject to discount 20%	6½¢
Tin-Lined Pipe, subject to discount 20%	15¢
Block Tin Pipe, subject to discount 20%	37½¢
Sheet, subject to discount 20%	7¢
Old Lead in exchange, 3½¢ ₩ lb.	

Solder—

½ @ ½ (Guaranteed)	13½¢ @ 15¢
No. 1	11¾¢ @ 12½¢

Prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	₩ lb 12½¢
Hallett's	" 11 ¢

Aluminum—

Prices per Ton.

Duty: 15¢ ₩ lb.

Over 98% pure	₩ lb .75
94% @ 98% pure	₩ lb .65

Old Metals—

Prices Paid in New York.

Heavy Copper	₩ lb 10 ¢
Light and Tinned Copper	₩ lb 9 ¢
Heavy Brass	₩ lb 7 ¢
Light Brass	₩ lb 6 ¢
Lead	₩ lb 3½¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 14 ¢
No. 2 Pewter	₩ lb 7 ¢
Wrought Scrap Iron	₩ gross ton $17.00
Heavy Cast Scrap	₩ gross ton 10.00
Stove Plate Scrap	₩ gross ton 7.00
Burnt Iron	₩ gross ton 500